

# United Republic of Tanzania

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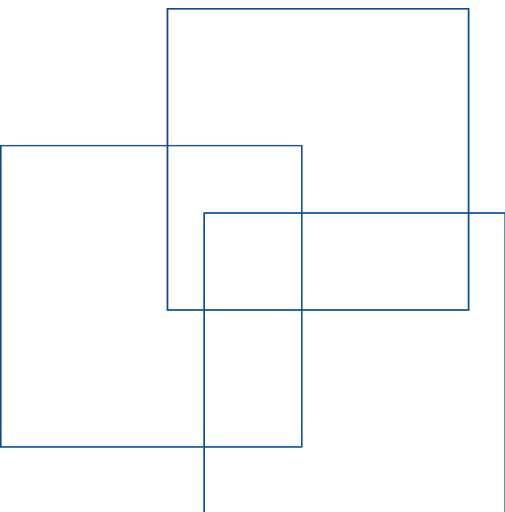


International  
Labour  
Organization

## Report to the Government

### Actuarial Valuation of the Workers Compensation Fund as of 1 July 2018

*Unedited final version*



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Global Employment Injury Programme

Enterprises  
Department

ILO Country  
Office for the  
United Republic  
of Tanzania,  
Burundi,  
Kenya, Rwanda  
and Uganda

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ILO/Global Employment Injury Programme (ILO/GEIP)  
Enterprises Department, Geneva

ILO Country Office for the United Republic of Tanzania, Burundi, Kenya, Rwanda, and Uganda

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## FOREWORD

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This report has been prepared in the framework of the Trust-in-Fund project between the Government of Tanzania and the International Labour Office (ILO) entitled “Capacity building and actuarial services to the Workers Compensation Fund of Tanzania” (TZA/18/04/TZA). The objective of the project is to foster governance of the Workers Compensation Fund of Tanzania, namely by:

- Securing the long-term financial sustainability of the WCF;
- Considering appropriate reform measures based on the findings and recommendations in the actuarial valuation report; and
- Building proper actuarial and statistical capacity for the staff of the Workers Compensation Fund (WCF) to support future actuarial valuations and reforms.

According to the legislation, the actuarial review of the scheme must be performed at least every three years. The fund was established on 1 July 2015. During the first year of the fund’s operation, only contribution was collected by WCF but no benefits were paid. On 1 July 2016, contributions and benefits payment were fully administered by WCF. The present review has been made as of 1 July 2018 and presents the results of the ILO actuarial study. It is structured as follows:

- Section 1 presents the experience and performance analysis of the WCF for the period since the establishment of the scheme.
- Section 2 presents the general demographic and macro-economic environment of Tanzania Mainland.
- Section 3 presents demographic and financial projections specific to the WCF for the period 2018–2048.
- Section 4 discusses a series of policy issues aimed at improving the scheme.

This actuarial review has been undertaken in compliance with international practice guidelines for social security actuarial valuations as promulgated by the ILO and the International Actuarial Association (IAA). It is limited to a technical actuarial review and is not intended to review the policy design, administration or investment arrangements, except in so far as these aspects have an impact on the actuarial review.

Actuarial valuations play a central role in monitoring and evaluating public employment injury schemes. In countries where governments invest in building up their own actuarial capacity, in-house actuarial valuations of their social security schemes often rely on the work of only a few actuaries. The ILO makes its demographic and financial projection models available to them through the advisory services of its Global Employment Injury Insurance Protection Programme (ILO/GEIP) located within the ILO Enterprises Department (ENTERPRISES). In addition, it promotes and directly implements peer reviews of in-house and external actuarial reviews with a view to assisting in the development of national actuarial practice at the employment injury insurance level, as well as to strengthening public financial governance.

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Upon the request of the Government of the United Republic of Tanzania represented by the Workers Compensation Fund (WCF), the ILO Global Employment GEIP of the Enterprises Department (ENTERPRISES) to complete the actuarial review. Mr Raphaël Imbeault, FSA, FCIA, senior actuary of ILO/GEIP, undertook this work on the behalf of the ILO with the assistance of Mr Gilles Binet, FSA, FCIA.

The ILO extends his sincere gratitude to the Director General of the Workers Compensation Fund of Tanzania, Mr Masha J. Mshomba, for his collaboration and assistance throughout the project. The ILO project team is grateful to Mr James Tenga, other WCF staff and the Director of the ILO Country Office for the United Republic of Tanzania, Burundi, Kenya, Rwanda and Uganda, Mr. Wellington Chibebe, who assisted throughout this project.

## ABBREVIATIONS AND ACRONYMS

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<b>ASU</b>	Actuarial Services Unit
<b>CIA</b>	Central Intelligence Agency
<b>CPI</b>	Consumer Price Index
<b>EII</b>	Employment Injury Insurance
<b>EIU</b>	Economist Intelligence Unit
<b>GDP</b>	Gross Domestic Product
<b>GEIP</b>	Global Employment Injury Programme
<b>IBNR</b>	Incurred But Not Reported
<b>ILFS</b>	Integrated Labour Force Survey
<b>ILO</b>	International Labour Organization
<b>IMF</b>	International Monetary Fund
<b>NBS</b>	National Bureau of Statistics
<b>NSSF</b>	National Social Security Fund
<b>PAYG</b>	Pay As You Go
<b>PD</b>	Permanent Disability
<b>PSSSF</b>	Public Service Social Security Fund
<b>PTD</b>	Permanent Total Disability
<b>TD</b>	Temporary Disability
<b>TFR</b>	Total Fertility Rate
<b>TZS</b>	Tanzanian Shilling
<b>WCF</b>	Workers Compensation Fund
<b>WPP</b>	World Population Prospect

## EXECUTIVE SUMMARY

The Workers Compensation Fund of Tanzania was established on 1 July 2015. During the first year of the fund's operation, only contribution was collected by WCF but no benefits were paid. On 1 July 2016, contributions and benefits payment were fully administered by WCF. The present review has been made as of 1 July 2018.

### REVIEW OF THE EXPERIENCE OF THE SCHEME

The review of the scheme experience indicates that the financial position is sound at the valuation date. The estimated cost of reported and unreported accidents and diseases has been lower than the contributions. The review indicated that the claims provisions reported in the statement of financial understates the benefits liabilities as the cost of pensions to be paid after the valuation date is not recognized. Recommendations to improve the situation will be presented.

The liabilities for the benefits based on a terminal funding basis still represent only about 5 percent of accumulated assets. It is reasonable to expect that the situation will change as workers and employers will become more aware of the scheme. Uncertainty about the long-term trend is high and the present actuarial valuation was conducted on prudent grounds relying on international experiences.

### VALUATION OF EMPLOYMENT INJURY BENEFITS

Demographic and financial projections were carried out according to the methodology and assumptions described in Appendices 3 and 4. It has been assumed that the incidence rate of accidents, diseases and commuting accident would gradually increase in the year 2030 to 5 times as much as that –of the current year. The severity of injured as well as the incident rate of deaths is assumed to remain constant over the projection period. A sensibility analysis was conducted on the rate of incident (one scenario with an increase of 3 times as much as the current state and another one with an increase of 7 times as much as the current state).

**Table ES.1 Projection of benefits cost expenditures for selected years (millions TZS)**

Year	Insurable earnings	Total cost of benefits	Benefits cost as % of insurable earnings
18-19	14,000,808	20,206	0.14
22-23	21,064,586	53,031	0.25
27-28	36,217,340	137,400	0.38
32-33	62,592,189	269,543	0.43
37-38	108,458,068	467,207	0.43
42-43	187,141,975	805,203	0.43
47-48	318,793,607	1,367,442	0.43

The cost of benefits increases from 0.14 percent of insurable earnings to 0.43 where it stabilizes since the ultimate level of incidence has been reached. In order to assess the contribution rate required to cover the cost of the scheme, the administrative expenditures must be added. For the base scenario, it has been assumed that they represent 17.3 percent of the current contributions. Given the relative weight of the public and private sector, the PAYG cost rate for the administration converges to 0.16 percent. This indicates that the total contribution rate converges to around 0.59 percent.



**Table ES.2 Fund projection for selected years (millions TZS)**

Year	Benefit liabilities	Free reserve	Funding ratio
17-18	10,813	206,970	20.1
22-23	143,573	772,400	6.4
27-28	541,057	1,653,718	4.1
32-33	1,444,928	3,041,782	3.1
37-38	3,098,018	5,539,642	2.8
42-43	6,041,873	10,045,907	2.7
47-48	11,178,172	18,107,061	2.6

The ratio of assets to benefits liabilities starts at 20.1, which is a high level, and converges to 2.6 at the end of the projection period. A ratio of 1 and above indicates that the plan is fully funded. The adequate level of funding is a policy issue to be agreed upon by stakeholders and the ratio should not be excessive. A balance should be achieved between objectives related to security of benefits, equity among different generations of employers and stability of contributions. In public EII schemes, a funding policy should set the target and the contributions may be changed when results deviate from the target. The funding ratio of public schemes should not usually go beyond 1.2, although it is necessary to take into account future fluctuations of income and expenditure and the stability of contributions.

Given that the WCF is at an early stage of an implementation and there is much uncertainty about the mid- and long-term trends, it is still too early to put in place a funding policy that would be applicable now and in the future. Although, given the size of the free reserve, the contribution rate may be reduced in the short-term, prudence is recommended in order to avoid significant future increases in contributions in case future experiences are financially unfavourable.

## RECOMMENDATIONS

### *Determination of contribution rates*

It seems clear that the WCF has considerable room for maneuvering in establishing short-term rates in the next few years while facing a significant problem because of the uncertainty of the long-term cost of the scheme. There are good reasons to believe that uncertainty will be lifted in the next actuarial valuation. The WCF faces a major dilemma that cannot be solved solely on the basis of actuarial considerations. On the one hand, the financial situation seen from all angles justifies a reduction in the contribution rate, but on the other hand, a too large reduction could lead to a medium-term weakening of the financial health while an insufficient reduction could lead to the accumulation of free reserves considered excessive. It would be a situation that would create instability and undermine the credibility of the scheme. While the projection period extends over 30 years, the recommendations on the contribution rate have been analyzed in the context that they will be subject to review after the next actuarial valuation.

One possibility that is analyzed at the initiative of the ILO is to consider a rate reduction of the private sector from 1.0 per cent of insurable earnings to 0.6 per cent for financial year 2020-2021, while keeping the contribution rate at 0.5 per cent for the public sector. This option maintains a funding ratio above 1 for the duration of the projection period.

However, two requests by WCF were made to the ILO in order to analyze the possibility to use a single contribution rate for both sectors. The contribution rate analyzed was a uniform 0.5 per cent and 0.6 per cent contribution rate that would be implemented for financial year 2020-2021. While the funding ratio goes below 1 during the projection period in the first scenario (0.5 per cent in 2020-2021), the fund is sufficient throughout the projection period to provide the benefit payments. This scenario has the effect of redistributing the free reserve at a quicker pace than the one proposed by the ILO. In the second scenario (0.6 per cent in 2020-2021), the funding ratio remains above 1.2, which is higher than the recommendation on the report on this subject and there is no justification to increase the contribution rate of the public sector as the current status quo situation

leads to a financially sustainable situation over the projection period. This scenario may be detrimental to the credibility of management and governors.

### **Pension indexing**

The results of this actuarial valuation indicate that the financial health of the plan is sound and that therefore there is no problem in making an increase of pensions in order to protect their purchasing power as at 1 July 2019. As it will be a few years before another actuarial valuation is done, the proposal consists of a formula that would be applied each year so as to avoid a long delay before the next increase.

The ILO recommendation is as follows:

- Pensions are increased every first July by taking into account the change in the sum of the 12-month CPIs ending in March on the sum of the 12-month CPIs ending in March of the previous year.
- For cases where the occurrence of the event (accident or illness) occurred in the 2016-2017 fiscal year, it is necessary to provide for 3 years of indexation, ie, those for 1 July 2017, 2018 and 2019, for those whose the occurrence is in the 2017-2018 fiscal year, there must be two and only one for those whose occurrence is in the 2018-2019 fiscal year.

**Table ES.3 Pension indexing on 1 July 2019**

Calculation of indexing percentages		
Period	Average CPI	Variation of average CPI
April 2015 to March 2016	99.29	
April 2016 to March 2017	104.38	5.13%
April 2017 to March 2018	109.49	4.89%
April 2018 to March 2019	113.07	3.27%
Indexation on 1 July 2019 or at the first payment of pension if later		
Year of incident	Percentage	
2016-2017	13.88%	
2017-2018	8.32%	
2018-2019	3.27%	

On subsequent 1 July in 2020, 2021 and so on, the same formula would be used to determine the indexing percentages.

### **Determination of benefits liability in financial statements**

Benefits liability currently reported in Statement of the Financial Position and the benefits expenses reported in the financial statements do not consider the value of permanent disability and survivors' pensions related to incidents that have occurred up to the end of the financial years beyond the end of the financial year. The intention of Note 3.5 "*Claims incurred comprise the total estimated cost of claims that have occurred in the year and for which the Fund is responsible, whether or not reported by the end of the year*" seems to recognize the full cost of claims. This implies to include the present value of future pension payments in the liabilities. This calculation is made in two steps.

- One of them consists in determining the present value of pensions in payment at the end of the year.
- The other one consists in determining the present value of pensions that will start to be paid after the end of the financial year, usually based on historical claims development patterns.

These calculations are the responsibility of the actuary. There are different techniques to obtain the results and ILO will be happy to support the WCF in its search to establish the most appropriate way. One way that the ILO could provide support to WCF is by providing detailed tables representing the present value of pensions by type of pensions, age and sex.

As the determination of the present value of pensions considers the time value of money, the sentence "*The Fund does not discount its liabilities for unpaid claims.*" would have to be adjusted accordingly. For short-term liabilities, not discounting liabilities is a practical approach that does

not distort much the reality, but it would not be acceptable in the determination of long-term liabilities.

ILO recommends using present value factors to determine the liabilities of pensions in the Statement of Financial Position. Those factors should be reviewed at each actuarial valuation in order to recognize the emerging demographic and economic trends.

### ***Minimum and maximum pensions***

Concerns are raised with temporary and long-term disability pensions with a degree of disability less than 100 percent.

- The pension is compared to the stated maximum pension with no adjustment for the degree of disability, and
- The minimum pension is not applicable.

WCF should also consider an alternative way to define the maximum and the minimum pensions. The calculation of the pension would be done considering the maximum insurable earnings. There would be no longer any need to define a maximum pension that requires to be adjusted according to the degree of disability. As far as the minimum pension is concerned, the solution would be to apply the stated amount in all the cases of various degree of disability, with consideration with the degree of disability. Hence, some small pensions could still be impacted by a partial minimum pension even if the degree of disability is low. It would ensure an equitable application of the minimum pension and basic protection of injured workers.

The ILO recommends that WCF initiate a change that would improve equity in the determination of minimum and maximum pensions and consider the opportunity to make it through the implementation of a ceiling on assessable earnings.

### ***Investment policy***

The investment policy covers all the elements that are generally found in this type of document. Its analysis revealed no flaws although we still have some comments to bring to the Board's attention.

The term "surplus" is used to refer to the assets to which the investment policy applies. This term seems a little vague and likely to be confusing. The fund aims to ensure the security of benefits payable over long periods of time and must as such invest the assets corresponding to those liabilities and not only the excess of assets over the liabilities as the use of the word surplus may be interpreted. It would be more accurate if the policy refers to assets that the fund does not need in the short term and that serve to secure the benefits liabilities.

In public schemes that are in principle assumed to exist indefinitely, the matching of assets and liabilities criterion does not have the importance that it has in the context of private insurance plans where assets must at any time meet the obligations relating to benefits in the event of closure of the company. A public plan fund can afford to invest in types of investments and on horizons dictated by its approach of balancing risk and return without worrying about limitations related to assets-liabilities matching as long as net cash flows are such that the fund will not have to liquidate assets at inappropriate times. It is thus possible to aim for a better return than in a portfolio forced to perfect matching of assets and liabilities and to be exposed to yield fluctuations. However, risk-taking must be limited to avoid permanent losses or excessive annual fluctuations of yield that are difficult for stakeholders to accept.

The benchmark of the real rate of return presented in Section 7.3.1 of the investment policy is of 1 per cent. The assumption used for this actuarial valuation is the same one as stated in the investment policy. The choice of this assumption assumes that the management of the fund will achieve a long-term yield that is equivalent to the benchmark.

The ILO recommends adjusting the investment policy in order to better recognize the context of a social security scheme deemed to last indefinitely.

## **Adequacy of permanent disability benefits**

### *Medical benefit*

Related to the medical benefits, section 62.-(1) of the Act stipulates that “*The Director-General shall, for a period of not more than two years from the date of an accident or the contracting of an occupational disease pay the reasonable cost incurred by or on behalf of an employee in respect of medical aid necessitated by the accident or the disease.*” The ILO believes that this 2-year limitation is contrary to the *raison d’être* of an EII scheme, is not in line with the Conventions and suggests that this should be removed.

In order to provide adequate compensation to the injured worker, the social partners in Tanzania should consider removing this limitation period. In order to contain the cost associated with these benefits that can be paid over a long period of time, WCF should instead issue guidance and recommendations on the appropriate medical assistance that should be provided over a long period of time to medically assist a disabled or diseased worker.

### *Compensation of permanent impairment*

The current compensation for permanent impairment in place at WCF is based on overall compensation for the occupational and physiological damages sustained by a work-related accident victim. This benefit is paid as a lifetime annuity or a lump sum. The benefit is calculated based on the degree of disability stated as per the guidelines published by WCF and assessed by medical practitioner in Tanzania. The amount of the benefit is purely based on the medical condition of the victim, without any consideration to the earning capacity following the work-related accident.

Another approach to compensation of permanent impairment is to analyse and compensate based on the loss of earning capacity and non-pecuniary damage. The loss of earning capacity takes into account the ability of the injured worker to return to any kind of work and to compensate for any loss of earning ability. Under this approach, an injured worker that is victim of a very small disablement that does not prevent him/her to return to his/her former work may only be entitled to the non-pecuniary damage compensation (usually a lump sum, but can also be provided as a lifetime annuity) and no loss of earning capacity pension.

In recent decades, the trend in European countries has been to move gradually from the system of overall compensation to a system of separate compensation for damage. These changes lead to a more personalised compensation and an individualisation of the compensation system. However, both systems have their advantages and disadvantages. Even if the compensation amount would differ from one system to the other, it is not certain that the permanent impairment compensation would necessarily increase in all cases. Some cases would see a lower benefit amount while other could see a higher benefit amount. The main important difference would be the methodology of the calculation and the approach of the compensation of WCF.

This change could be contemplated in the long-term for WCF. As the scheme will get more mature and when industry-rating will be implemented, discussion with social partners in Tanzania could be done around the appropriate compensation system that should be used to deliver permanent impairment benefit to disabled and sick workers.

ILO recommends putting in place internal mechanisms to assess the adequacy of benefits to permanently disabled workers.

### **Data management**

WCF has a mid-term plan to implement industry rating contribution setting and, following this implementation, experience-based rating system in the long-term. WCF is seeking guidance on this subject and the ILO believes that one key aspect of implementing this system is related to the data management.

First, it is recommended that the data management system is adjusted to systematically refer to the industry. This reference to the industry needs to be systematic for the classification of covered worker, and also needs to be implemented in the claims data. The systematic reference will allow for a thorough actuarial calculation for the next actuarial valuation, as to develop a solid contribution base and detailed claims projection by industry. As more experience will have emerge

and the data system will be robust, this rate-setting activity will be carried out with more confidence and WCF will be able to draft a possible roadmap on the implementation of industry-rate setting.

One other addition to be made to the claims data in place should be to add the nature of the death of the insured worker. As of now, deaths are classified as one event, without regards to the nature of the incident (accident, disease or commuting). However, after additional data request and work from WCF, it was found out that the death claims may be different by the nature of the incident.

It is important to remember that the current industry categories used by WCF may combine different risk profiles within the same industry.

At this stage, it is too premature to reflect on possible change to the industry classification system used by WCF. The ILO proposes to keep the current industry rating in place and to gather more data based on the experience of the scheme in the next years. For the next actuarial valuation, analysis of the industry experience will allow formal proposition to further refine the category used by WCF. It is important to remember that a refined rating system could involve numerous categories. Some systems use up to 100 different type of industry and sub-categories to establish their rating system. Stakeholders will have to discuss on a potential and implementable system in Tanzania that reflects the reality on the ground.

## INTRODUCTION

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Article 86 of Workers' Compensation Act stipulates that a periodic actuarial review should be carried out at least at intervals not more than three years by an actuary appointed by the Board and that the result be included in the next annual report of the Fund. The WCF Fund requested the ILO to carry out the first actuarial valuation of the Social Security Fund as of June 2018. Statistical data and information for this valuation have been obtained via electronic transfers between WCF staff and the actuaries. Subsequently, the model of the Global Employment Injury Insurance Protection Programme (GEIP) of the ILO was used to prepare the demographic and financial projections associated with the actuarial review. The report has been structured as follows:

- Section 1 presents a review of the experience of the three-year period from 1 March 2015 to 30 June 2018.
- Section 2 describes the projection of the general population and the macroeconomic framework used for the valuation.
- Section 3 presents the projections and sensitivity tests.
- Section 4 presents discussions and recommendations on compensation and financing issues.

The appendices contain a summary of key WCF contribution and benefit provisions, an assessment of compliance with ILO Convention 121 and a description of the methodology the key data inputs and the assumptions used for the valuation.

# 1

## 1 REVIEW OF THE EXPERIENCE OF THE SCHEME

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This section discusses the evolution of the financial situation of the fund from inception to the valuation date based on the information in the financial statements.

It is understood that financial statements of public employment injury compensation schemes should present the information in a manner consistent with its funding method. One objective of this evaluation is to recommend a funding method in line with the objectives of stakeholders of the WCF. In the meantime, the financial statements are based on accounting rules adopted by the WCF and its auditors that are disclosed in their notes. Such rules are not fully consistent with the funding method that will be used to present the results of the valuation<sup>1</sup>, namely the terminal funding method. To the extent that the funding method recommended in this valuation will be used by the WCF, adjustments in certain elements of the financial statements will have to be made. Major elements to be modified will be identified in this section in order to facilitate the understanding of the results of the financial projections.

The data presented in this section comes from the WCF Annual Report 2015/2016 and the WCF Reports and Financial Statements for the year ended June 2018 (still in draft version for the current edition of the actuarial report). The data for both years ending in June 2017 and 2018 are taken from this last document.

### 1.1 INCOME AND EXPENDITURE

Table 1.1 reproduces the elements of the Statement of Comprehensive Income as presented in the WCF financial statements. For the purpose of the actuarial analysis, some expense items related to investments will be deducted from investment income to better reflect the nature of the assumptions needed for projections instead of being reported as expenses.

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<sup>1</sup> The current presentation of the financial statements is more in line with what is known as the pay-as-you-go method.



**Table 1.1 Statement of Comprehensive Income (TZS '000')**

Year ended on 30 June	2016 (16 mths)	2017	2018
<b>Revenue</b>			
Contribution income <sup>1</sup>	68,400,079	77,714,703	116,766,256
Investment income	1,599,361	10,425,506	17,915,505
Other income	2,000		99,644
<b>Total revenue</b>	<b>70,001,440</b>	<b>88,140,209</b>	<b>134,781,405</b>
<b>Expenses</b>			
Benefits		1,554,760	2,846,409
Impairment of financial assets <sup>2</sup>		26,664,543	5,809,754
Investment management expenses			89,043
Administrative expenses	3,877,768	9,497,758	17,910,994
SSRA Levy			296,762
Fair value change of listed equity shares			1,194,118
<b>Total expenses</b>	<b>3,877,768</b>	<b>37,717,061</b>	<b>28,147,080</b>
<b>Surplus before income tax</b>	<b>66,123,672</b>	<b>50,423,148</b>	<b>106,634,325</b>
Income tax expense	443,826	3,276,329	4,170,078
<b>Surplus for the year</b>	<b>65,679,846</b>	<b>47,146,819</b>	<b>102,464,247</b>

Author's note:

<sup>1</sup> Contribution income of 2018 includes an amount of 11,274,983 (TZS '000') interest from late contributions payment.

<sup>2</sup> The amount of 26,664,543 (TZS '000') in 2017 is related to contributions receivable from the public sector for 2016.

The results should be interpreted with caution as the scheme has only been in place for a little more than three years and workers' compensation benefits were payable only during the last two years. Furthermore, employers as well as workers are not yet familiar with the compensation scheme and the administrative practices of WCF are evolving. Nevertheless, it is relevant to highlight the following in Table 1.1:

- Benefits expenses are low compared to contribution income. One of the reasons is that the current accounting rules do not consider the full cost of benefits as the present value of pensions over their expected payment period. Another reason is the low incidence of claims which is probably related to underuse of the system. These specific elements will be discussed later in the report.
- Regardless of the problem of payment of public sector contributions in 2016, contribution income increases in 2017 and 2018 indicate that coverage is improving. The trend is expected to continue until WCF succeeds in reaching all workers and employers subject to the law.
- The scheme must pay taxes on its investment income, which is unusual for a social security scheme for which such income is necessary to ensure the security of benefits.
- Administrative expenses have risen rapidly, which is normally expected in start-up stage. As the plan matures, international experience suggests that they will or should stabilize at a certain threshold expressed in terms of percentage of contributions and/or benefits.

The annual surpluses are material, which looks positive for the financial health of the plan, but also raises questions about adequacy of benefits and/or contributions to which the present actuarial analysis aims to provide answers. Given the short experience of the scheme, there is still a lot of uncertainty about long-term trends that may be widely different than the recent results.

## 1.2 BALANCE SHEET

Table 1.2 presents a summary of the Statement of Financial Position for the three financial years. For the sake of simplicity, some elements have been grouped.



**Table 1.2 Statement of Financial Position (TZS '000')**

Year ended on 30 June	2016 (16 mths)	2017	2018
<b>Assets</b>			
Investment in fixed income	31,522,993	78,461,430	139,451,331
Investment in equities and property		2,622	23,527,155
Contributions receivables <sup>1</sup>	33,840,689	13,094,755	57,033,755
Other assets <sup>2</sup>	1,081,554	24,871,687	7,294,339
<b>Total assets</b>	<b>66,445,236</b>	<b>116,430,494</b>	<b>227,306,580</b>
<b>Liabilities</b>			
Claims provision		687,450	1,259,503
Other liabilities	765,390	2,916,379	10,756,615
<b>Total liabilities</b>	<b>765,390</b>	<b>3,603,829</b>	<b>12,016,118</b>
<b>Net assets</b>	<b>65,679,846</b>	<b>112,826,665</b>	<b>215,290,462</b>
<b>Accumulated funds</b>			
Beginning of year		65,679,846	112,826,665
Comprehensive income for the year	65,679,846	47,146,819	102,464,247
<b>Total reserves</b>	<b>65,679,846</b>	<b>112,826,665</b>	<b>215,290,912</b>

Author's note:

<sup>1</sup> The contributions receivables of 26,664,543 (TZS '000') for the public sector in 2016 have been transferred to doubtful debts in 2017. Contributions receivables of 2018 include an amount of 45,766,762 (TZS '000') for contributions from the private sector and an amount of 11,274,983 (TZS '000') for interest on these receivables.

<sup>2</sup> Other assets of 2017 include an amount of 20,300,000 (TZS '000') as "Advance towards publicly quoted shares". This amount was moved to listed equities in 2018 after completion of transaction.

Despite the limitations previously expressed in the interpretation of financial results, it remains relevant to present the following highlights:

- The claims provisions represent only a small proportion of the assets. The reasons are the same as those expressed in the first bullet after Table 1.1. Those are:
  - Non recognition of full cost of disability and survivors' pensions; and
  - Apparent underuse of the scheme.

Contributions receivable have increased significantly in 2018. This suggests that the WCF should be paying particular attention to employer's compliance. It seems that the public sector has not complied in 2016 and the government's intent to comply with the obligation to pay contributions in the first year remains to be clarified.

## 1.3 ADDITIONAL INFORMATION ON SELECTED ITEMS

### 1.3.1 Contribution income

Table 1.3 provides further information on contributions income from the notes to the financial statements and the statements of cash flows.

**Table 1.3 Contribution income (TZS '000')**

Year ended on 30 June	2016 (16 mths)	2017	2018
<b>Contributions income</b>			
Private	41,735,536	51,388,143	81,765,003
Public	26,664,543	26,326,560	23,726,270
Interest <sup>1</sup>			11,274,983
<b>Total contributions income</b>	<b>68,400,079</b>	<b>77,714,703</b>	<b>116,766,256</b>
<b>Contributions receivable</b>			
Private	7,176,145	3,777,113	45,766,762
Public	26,664,543	35,982,186	26,664,544
Interest <sup>1</sup>			11,266,993
<b>Sub-total receivables</b>	<b>33,840,688</b>	<b>39,759,299</b>	<b>83,698,299</b>
Allowance for doubtful receivables <sup>2</sup>		26,664,544	26,664,544
<b>Net contribution receivables<sup>3</sup></b>	<b>33,840,688</b>	<b>13,094,755</b>	<b>57,033,755</b>
<b>Breakdown of contribution income</b>			
Contribution received - cash flow <sup>4</sup>	34,559,391	71,796,086	72,819,267
Annual variation of receivables	33,840,688	5,918,611	43,939,000
<b>Total contribution income</b>	<b>68,400,079</b>	<b>77,714,697</b>	<b>116,758,267</b>

Author's notes:

<sup>1</sup> Interest income on contributions will be considered as investment income for the purpose of actuarial analysis.

<sup>2</sup> The allowance for doubtful contribution receivables is considered as an expenditure for analysis purpose, not as a reduction of contribution income, as it is more meaningful to assess trends in coverage.

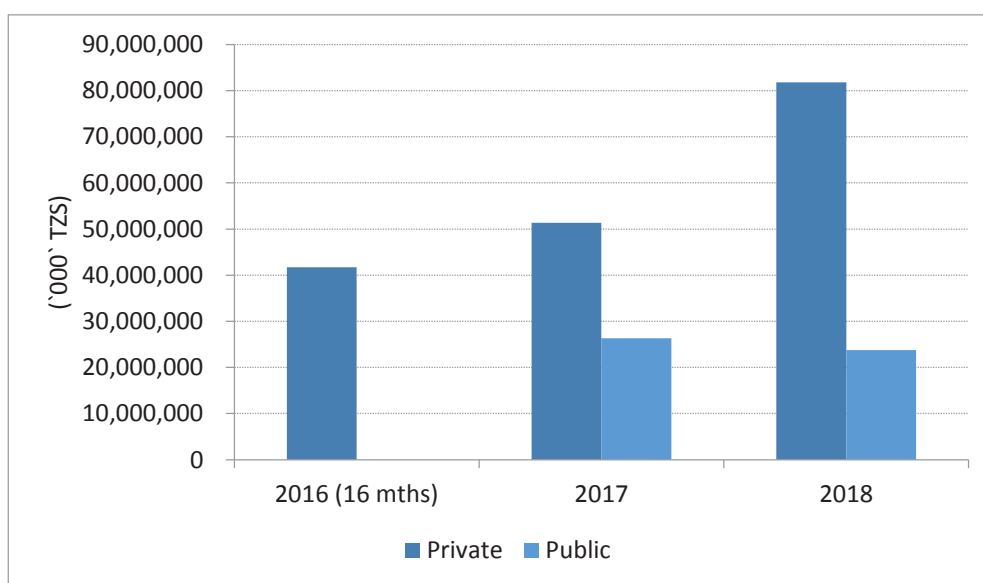
<sup>3</sup> The net contribution receivables can be split by sector as it is known that allowance for doubtful receivables applies to public sector only.

<sup>4</sup> The cash flow data is not separated between sectors.

As the contribution rate of the private sector is twice that of the public one, it can be deduced from the information available that the insurable earnings of the private sector are about 72 percent larger than in the public one in 2018.

Figure 1.1 shows the contribution income by sector net of doubtful debts known at the valuation date. It does not consider the interest income accrued on receivables as it will be considered in the investment income analysis later. The portrait of contribution income for the first three financial years of the scheme is likely to change and look less favourable with the collection of arrears if more receivables are transferred to allowance for doubtful debts. It can be observed that revenues from the private sector have steadily increased due to efforts in employers' registration.

**Figure 1.1 Contribution by sector net of allowance for doubtful receivables**



### 1.3.2 Benefit expenses

Table 1.4 presents the benefits expenses by category as reported in Note 32 of financial statements. Claims are presented on an incurred basis. Accounting practices state that “*Claims incurred comprise the total estimated cost of claims that have occurred in the year and for which the Fund is responsible, whether or not reported by the end of the year.*”

**Table 1.4 Benefit expenses (TZS ‘000’)**

Category	2017	2018
Benefit administration costs <sup>1</sup>	253,467	311,639
Medical aids	231,536	157,076
Temporary disablement	147,419	515,943
Permanent disablement	165,085	466,038
Funeral grants	8,800	8,400
Survivors grant	61,003	100,072
Monthly pensions		72,345
Rehabilitation services		3,000
Claims provision	687,450	1,211,896
<b>Total benefits expenses</b>	<b>1,554,760</b>	<b>2,846,409</b>

Author's notes:

<sup>1</sup> This item is made of payments for the administration of medical services.

As mentioned previously the present value of future payments to permanently disabled and survivors of work-related deceased workers is not included in those expenses. The claims provisions for incurred but unreported claims (IBNR) have been determined through assumptions described in the financial statements involving a projection of the ultimate number of claims and their average costs. As the average cost of claims used in the process does not include the full cost of pensions, it can be said that the benefit expenses are underestimated. Approaches to more accurately reflect the actual costs and liabilities of the scheme will be discussed later in the report.

The current accounting practices imply that the amount of expense reported in the Statement of Comprehensive Income includes payments, accruals and the IBNR. Table 1.5 presents data on those three elements.

**Table 1.5 Benefit expenses – cash flow and variation in liabilities (TZS ‘000’)**

	2017	2018
<b>Statement of cash flows</b>		
<i>Benefits paid (A)</i>	359,461	1,016,815
<b>Accruals at end year (Note 27)</b>	507,849	1,233,030
<i>Annual variation (B)</i>	507,849	725,181
<b>Claims provision at end year (Note 28)</b>	687,450	1,259,503
<i>Annual variation<sup>1</sup> (C)</i>	687,450	572,053
<b>Total (A+B+C)</b>	<b>1,554,760</b>	<b>2,314,049</b>

Author's notes:

<sup>1</sup> The claims provision of 1,211,896 presented in Table 4 for 2018 can be obtained by adding payments of 639,843 made during the year 2018 to the annual variation of 572,049.

By adding together items A, B and C, the benefits expenses reported in the statements comprehensive income should be obtained. The equation holds for 2017 (1,554,760) but does not for 2018 as the amount reported in the Statement of Comprehensive Income is 2,846,409.

### 1.3.3 Administrative expenses

For the purposes of projection, administrative expenses can be split in to expenses related to staff and other expenses. Table 1.6 presents this analysis. It also shows the ratio of administration fees to contribution income.

**Table 1.6 Administrative expenses** (TZS '000')

Year ended on 30 June	2016 (16 mths)	2017	2018
Administrative expenses	3,877,768	9,497,758	17,910,994
of which staff costs	768,570	3,875,861	8,575,451
Share of staff costs	19.8%	40.8%	47.9%
Ratio to contribution income	9.3%	12.2%	15.3%

Although the data should be interpreted with caution given the lack of experience, we can still observe some elements of interest.

- It should be noted that the proportion of expenditure on staff salaries tends to reach 50% during the period, a proportion that is frequently observed in similar public plans.
- With regards to the administrative expenses/contribution income ratio, its evolution is explained by the fact that in the first years of the scheme, the WCF suffered from a shortage of manpower and was supported by the government. International standards suggest it is close to plateau.

### 1.3.4 Assets and investment yield

Table 1.7 presents detailed information on the assets available in the notes to the financial statements.

**Table 1.7 Investment by category** (TZS '000')

Year ended on 30 June	2016 (16 mths)	2017	2018
<b>Fixed income investments</b>			
Fixed deposits	27,139,617	13,220,695	2,284,176
Treasury bonds		58,576,008	135,024,546
Treasury bills		6,664,727	
Corporate bonds			2,142,609
Advance towards unlisted equity shares		4,403,440	
Listed equity shares			19,105,880
<b>Total fixed income</b>	<b>27,139,617</b>	<b>78,461,430</b>	<b>162,960,651</b>
<b>Investment in equities and property</b>			
Dividend receivables			15,213
Property		2,622	2,622
<b>Total equities and property</b>		<b>2,622</b>	<b>17,835</b>
<b>Total investments</b>	<b>27,139,617</b>	<b>78,464,052</b>	<b>162,978,486</b>
<b>Total investments/Total assets<sup>1</sup></b>	<b>41%</b>	<b>67%</b>	<b>72%</b>

<sup>1</sup> Calculation by author: net assets used in denominator are presented in Table 1.2.

As mentioned previously, assets have been increasing significantly over the three-year period. This phenomenon is normal during the maturation phase of a compensation scheme providing pension benefits payable over a long period. Such assets are generally offset by an equivalent increase in benefits liabilities.

Table 1.8 presents the investment income related to investments of Table 1.7. The total investment income corresponds to the total investment income reported in Table 1.1.

**Table 1.8 Investment income (TZS '000')**

Year ended on 30 June	2016 (16 mths)	2017	2018
<b>Fixed income investments</b>			
Interest from fixed deposits	1,517,059	3,507,719	1,439,365
Interest from call account	82,302	550,725	209,690
Interest from Treasury bills		1,002,127	335,274
Interest from Treasury bonds		5,364,935	15,484,306
Interest from Corporate bonds			142,609
<b>Total - fixed income</b>	<b>1,599,361</b>	<b>10,425,506</b>	<b>17,611,244</b>
<b>Equities and property</b>			
Dividend income			304,261
<b>Total - equities and property</b>			<b>304,261</b>
<b>Total</b>	<b>1,599,361</b>	<b>10,425,506</b>	<b>17,915,505</b>

The assumption on the rate of return of the fund has a significant impact on the financial projections. It is normally established by taking into consideration several factors such as the economic scenario and the investment policy of the fund during the projection period as well as the past performance of the fund manager in relation to indices to some extent. The history of returns is useful to measure the latter element. WCF's experience is still too young to be given much weight in the selection of the rate of return for this evaluation. Nevertheless, it may be worthwhile to estimate the observed rate of return while bearing in mind the limitations of such an exercise.

In calculating the observed rate of return of the fund, the general practice is to account for changes in market value in investment income as well as administration fees for asset management. Table 1.9 presents the detailed calculation of the investment yield for 2017 and 2018.

**Table 1.9 Estimation of investment yield on the total assets**

		2017	2018
A	Fund beginning of year <sup>1</sup>	39,780,693	116,430,494
B	Fund end of year	116,430,494	227,306,580
	Investment income (Table 1.1)	10,425,506	17,915,505
	Adjustments to investment income		
	Interest on contribution income		11,274,983
	Impairment financial assets		-5,809,754
	Fair value change of listed equities		-1,194,118
	Investment management expenses		-89,043
C	Investment income net of adjustments	10,425,506	22,097,573
	<b>Estimated yield: <math>2 \times C / (A+B-C)</math></b>	<b>14.3%</b>	<b>13.7%</b>

An important proportion of investment income of 2018 is related to accruals on contributions receivables which are subject to significant uncertainty.

Table 1.10 presents the calculation of the investment yields on the invested assets only.

**Table 1.10 Estimation of investment yield on the invested assets**

		2017	2018
A	Invested assets beginning of year	27,139,617	78,464,052
B	Invested assets end of year	78,464,052	162,978,486
	Investment income (Table 2.1)	10,425,506	17,611,244
	Adjustments to investment income		
	Impairment financial assets		-5,809,754
	Fair value change of listed equities		-1,194,118
	Investment management expenses		-89,043
C	Investment income net of adjustments	10,425,506	10,518,329
	<b>Estimated yield: <math>2C / (A+B-C)</math></b>	<b>21.9%</b>	<b>9.1%</b>

Considering inflation of 5.44 percent in 2017 and 3.40 percent in 2018, the estimated real rates of return on invested assets are 15.0 percent and 5.5 percent in those years.

The estimated yields do not take account of the tax expense on investment that has been paid by the fund. The determination of the assumption on the investment yield of the fund will be discussed later.

## 1.4 CONCLUSION

Though the financial statements fail to recognize the full costs of benefits awarded, the use of certain relationships between accounting data generally observed in such public employment injury compensation scheme<sup>2</sup> leads to the preliminary conclusion that the financial position of the plan does not foresee any serious problems in the short term, though intergenerational equity between employers suggests to be careful in the management of surpluses. This actuarial valuation will provide a diagnosis of the situation and make appropriate recommendations in the circumstances.

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<sup>2</sup> The present value of future pensions can be estimated by multiplying the disbursements of one year by a factor. This factor can vary within a fairly wide range, for example from 15 to 30. The liability for benefits would not reach 10 million even using the upper bound. The difference between the assets and the liabilities would still be material at more than 150,000,000 thousand TZS at June 2018.

# 2

## 2 PROJECTED DEMOGRAPHIC AND MACRO-ECONOMIC ENVIRONMENT OF TANZANIA MAINLAND

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An EII scheme is one of the socio-economic and political systems which functions within an environment of national economy. Therefore, it does not function independently of the demographic and economic context. The demographic and macroeconomic models and their assumptions are part of the core elements of the actuarial valuation of a social security scheme.

The demographic and economic assumptions have been projected over 75 years in order to appropriately measure the demographic and financial evolution of all the social security scheme and social insurance scheme in Tanzania Mainland over the long-term run. This model was jointly developed between GEIP and the ASU units of the ILO for the latest actuarial valuations in Tanzania Mainland. However, it is important to note that the projection period for WCF is limited to the next 30 years. Such a long period of projection allows to better draw conclusions regarding the long-term sustainability of the scheme, but also contributes to provide a clearer picture of the scheme's sensitivity to assumptions or benefits changes.

Since the jointly developed demographic and macro-economic model used for the actuarial valuation covers a period of 75 years, some reference to the ultimate assumption used may go beyond the required projection period of 30 years for WCF. Assumptions will be referred to the period required, i.e. may go beyond the 30 years projection period of WCF for the sake of understanding, but the relevant tables for WCF will be limited to the projection period.

### 2.1 POPULATION OF MAINLAND TANZANIA

Population projections require specific assumptions concerning mortality, fertility and migration.

As WCF covers members within Tanzania Mainland exclusively, the Tanzania Mainland population has been modelled and projected under this actuarial valuation. The Tanzania Mainland total population comes from the National Population Projections of the National Bureau of Statistics (NBS)<sup>3</sup>. As inconsistencies have been found in the population distribution published by the NBS<sup>4</sup>, the population has been distributed by age and sex using the 2017 World Population Prospects (WPP) for United Republic of Tanzania and adjusted to reflect the country's main demographic indicators<sup>5</sup>.

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<sup>3</sup> The Population Projection (February 2018) is based on the Population and Housing Census (PHC) of 2012.

<sup>4</sup> The age-structure of the Tanzania Mainland population (NBS) shows significant fluctuations among individual ages as some ages.

<sup>5</sup> Refer to the initial Total Fertility Rate (TFR) and the initial sex-ratio of newborns.

**Table 2.2 Population of Tanzania Mainland, by age and sex, 2018**

Age	Male	Female	Total
<b>0-4</b>	4,579,138	4,486,679	9,065,817
<b>5-9</b>	3,878,550	3,888,150	7,766,700
<b>10-14</b>	3,269,697	3,349,822	6,619,519
<b>15-19</b>	2,743,468	2,869,222	5,612,690
<b>20-24</b>	2,291,124	2,443,279	4,734,403
<b>25-29</b>	1,910,093	2,067,803	3,977,896
<b>30-34</b>	1,613,539	1,742,013	3,355,552
<b>35-39</b>	1,343,794	1,426,912	2,770,706
<b>40-44</b>	1,072,688	1,114,578	2,187,266
<b>45-49</b>	822,716	866,798	1,689,514
<b>50-54</b>	625,543	688,821	1,314,364
<b>55-59</b>	492,155	562,487	1,054,642
<b>60-64</b>	362,160	454,637	816,797
<b>65-69</b>	293,588	363,396	656,984
<b>70-74</b>	198,020	262,689	460,709
<b>75-79</b>	135,000	163,496	298,496
<b>80-84</b>	70,918	86,032	156,950
<b>85-89</b>	33,654	30,852	64,506
<b>90-94</b>	5,089	8,690	13,779
<b>95+</b>	634	1,390	2,024
<b>Total</b>	<b>25,741,568</b>	<b>26,877,746</b>	<b>52,619,314</b>

### **2.1.1 Fertility**

According to the 2017 WPP, and in line with the 2002-2012 NBS statistics, the Total Fertility Rate (TFR) is estimated to decrease gradually from 4.92 children per female in 2015-2020 to 2.34 children per female in 2095-2100. This valuation assumes that the TFR will gradually decrease from its current level of 4.92 in 2016 and reach 2.45 in 2093, 75 years after the valuation date. The 2017 WPP statistics on age-specific fertility rates for Tanzania have also been used to project the Tanzania Mainland population over the projection period.

Similarly to the Central Intelligence Agency (CIA) Factbook, the 2017 WPP and the World Bank, the sex-ratio of newborns has been estimated to 1.03 male per female.

The age-specific fertility rates and TFR appear in Table 2.2.



**Table 2.2 Age specific fertility rate and TFR**

Age of mother	Fertility rate	
	2018	2048
15-19	0.11498	0.07168
20-24	0.24966	0.17814
25-29	0.25175	0.21616
30-34	0.18764	0.15819
35-39	0.11695	0.08368
40-44	0.05220	0.03113
45-49	0.01082	0.00569
<b>Total fertility rate</b>	<b>4.92</b>	<b>3.72</b>

### 2.1.2 Mortality

According to the 2017 WPP, the life expectancy at birth is estimated at 65.2 years for males and 68.5 years for females for year 2018<sup>6</sup>. The life expectancy at birth is assumed to reach 77.1 years for males and 81.1 years for females by 2093, 75 years after the actuarial valuation date. The 2017 WPP intermediate rates of mortality improvement have been used to project the mortality rates for the Tanzania Mainland general population.

**Table 2.3 Life expectancy at selected ages, 2018, 2030, 2040 and 2048**

Year	Male				Female		
	At birth	At 20	At 60		At birth	At 20	At 60
2018	65.2	50.8	18.1		68.5	53.0	19.1
2030	66.8	51.9	18.6		70.2	54.3	19.9
2040	68.2	52.9	19.1		71.6	55.4	20.5
2048	69.4	53.7	19.6		72.9	56.3	21.1

### 2.1.3 Migration

Few migration data is available on Tanzania Mainland. Under this actuarial valuation, the net migration rates from the 2017 WPP have been used. The decreasing trend in net migration after 2018 has been kept unchanged from the 2017 WPP projection estimates.

The net migration rate is estimated at 0.34 per cent of the total population in 2018, decreasing gradually to 0.04 per cent in 2093, 75 years after the actuarial valuation date.

### 2.1.4 Population projection

The total population of Tanzania Mainland, estimated to 52.6 million in 2018, is projected to increase at an average rate of 2.2 per cent annually over the projection period, to reach a total population of about 261.5 million in 2093.

<sup>6</sup> The estimated mortality rates for 2018 has been derived from the 2017 WPP using linear interpolation between periods 2010-2015 and 2015-2020.

**Table 2.4 Projected rate of population growth, 2018-2049**

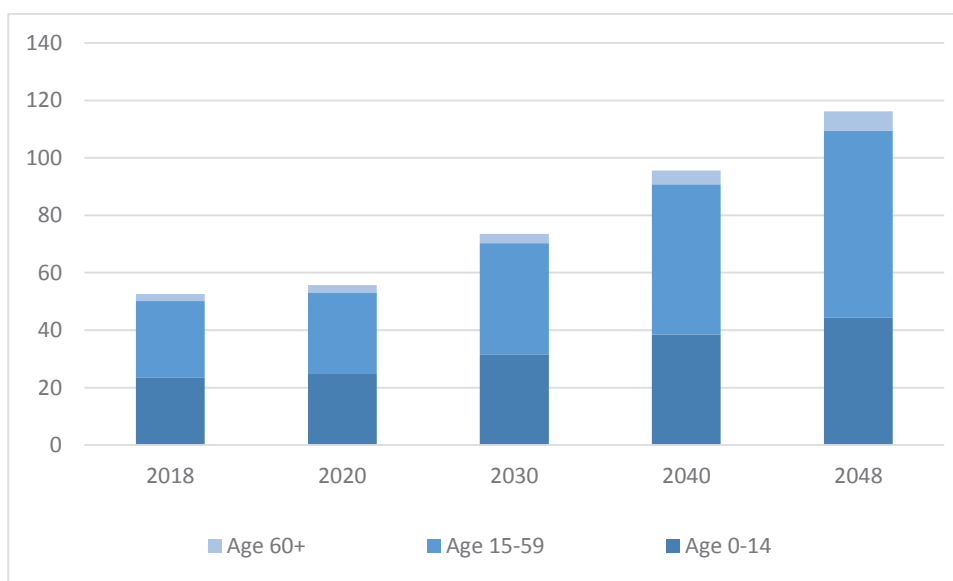
Period	General population	Working-age population (15-59)
2018-2029	2.8	3.2
2030-2039	2.7	3.0
2040-2049	2.4	2.7

Table 2.5 presents detailed population projections by age group.

**Table 2.5 Projected population of Tanzania Mainland, 2018-2048**

	Age group			
	0-14	15-59	60+	Total
2018	23,452,036	26,697,033	2,470,245	52,619,314
2020	24,772,971	28,374,588	2,560,271	55,707,830
2030	31,375,171	38,895,642	3,277,194	73,548,007
2040	38,429,924	52,396,742	4,794,052	95,620,718
2048	44,435,970	65,064,262	6,742,133	116,242,365

**Figure 2.1 Projected population of Mainland Tanzania, 2018-2048 (in millions)**



## 2.2 MACROECONOMIC FRAMEWORK

### 2.2.1 Economic growth, productivity and employment

According to the NBS, the annual real GDP growth rate averaged at about 7.0 per cent between 2014 and 2017 inclusively<sup>7</sup>. The unemployment rate for year 2014 has been reassessed to 10.3 per cent in the 2014 Integrated Labour Force Survey (ILFS), while it was previously estimated at 5.6 per cent in 2012. The significant increase observed (from 5.6 to 10.3 per cent) is mainly explained by a change in methodology used by the NBS to calculate the unemployment rate in Tanzania. According to the World Bank, the unemployment rate in Tanzania slightly increased between 2014 and 2017. The unemployment rate has been estimated at 13.0 per cent in 2018.

<sup>7</sup> NBS Report on Gross Domestic Product, March 2018, also consistent with the estimates from EIU and IMF.

The base macroeconomic scenario underlying the projections is a strong but sustainable economic growth. According to the Economist Intelligence Unit (EIU), the real GDP growth rate is estimated at 5.5 per cent for 2018 and projected to vary between 5.1 and 5.5 per cent per year from 2019 to 2023. To reflect the strong economic growth experienced in Tanzania in the recent years, the annual real GDP growth rate has been assumed at 6.0 per cent for years 2018 and 2019, decreasing thereafter to reach 5.5 per cent in year 2024. The real GDP growth rate is then projected to gradually decrease to 4.0 per cent per year by 2075 and remain unchanged thereafter. The average real GDP growth rate over a projection period of 75 years is assumed at 4.6 per cent per year.

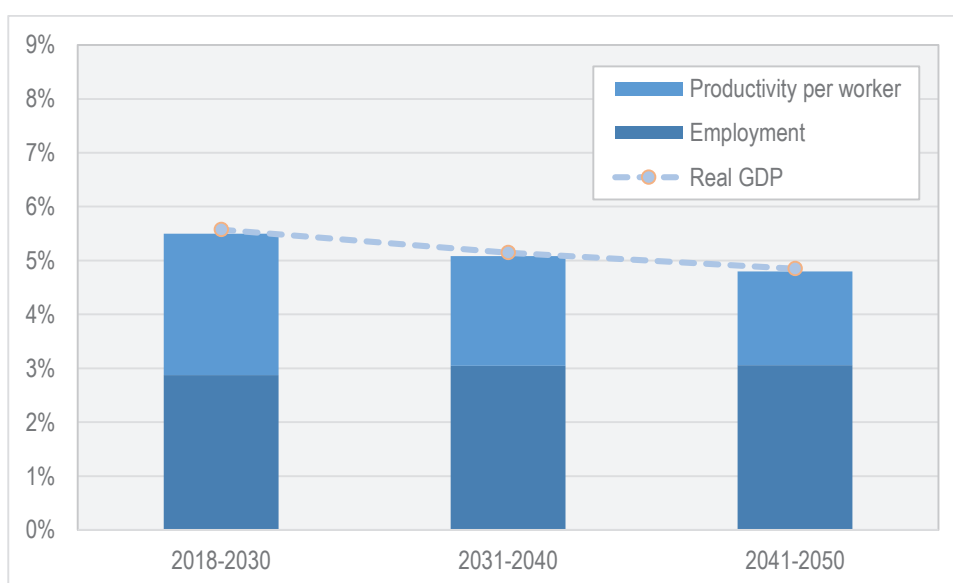
In Table 2.6, the productivity growth rates for years 2018 to 2023 have been set in such a way as to gradually stabilize the unemployment rate over the short term. The annual productivity growth rate is assumed to decrease from 3.50 per cent in 2018 to 2.45 per cent in 2023, and to 1.70 per cent in 2045. The productivity growth rate is projected to rise again to reach 2.10 per cent at the end of the projection period of 75 years, making up for the gradual deceleration of the employed population growth. The average productivity growth rate over the projection period of 75 years is at 2.0 per cent per year.

**Table 2.6 Real GDP, productivity and employment growth rates, 2018-2048** (in percentage)

Year	Real GDP growth	Productivity growth per worker	Employment growth
<b>2018</b>	6.0	3.5	2.5
<b>2019</b>	6.0	3.5	2.4
<b>2021</b>	5.9	3.2	2.7
<b>2022</b>	5.8	2.9	2.8
<b>2023</b>	5.7	2.7	2.9
<b>2030</b>	5.6	2.6	2.9
<b>2040</b>	5.3	2.3	3.0
<b>2048</b>	4.8	1.7	3.0
<b>Average</b>	<b>5.3</b>	<b>2.2</b>	<b>3.0</b>

Figure 2.2 illustrates the average real GDP growth rates, employment growth rates and productivity growth rates over the projection period.

**Figure 2.2 Average real GDP, productivity and employment growth, 2018-2050**



The evolution of the total population of Tanzania Mainland, as well as the labour force population and the employed and unemployed populations appear in Table 2.7. The labour force population distribution and the employed population distribution for 2018 have been estimated using the latest statistics available in the National Socio-Economic Profile 2014, applied to the 2018 Tanzania Mainland population distribution.

**Table 2.7 Population, labour force and employment, 2018-2048**

	2018	2025	2040	2048
<b>Population (in thousands)</b>	<b>52,619</b>	<b>64,128</b>	<b>95,621</b>	<b>116,243</b>
Male	25,742	31,544	47,425	57,803
Female	26,878	32,584	48,196	58,440
<b>Population aged 15-69 (in thousands)</b>	<b>28,171</b>	<b>34,912</b>	<b>52,397</b>	<b>65,064</b>
Male	13,571	16,924	25,844	32,289
Female	14,600	17,988	26,553	32,775
<b>Labour force participation rate (%)</b>	<b>75.1</b>	<b>74.7</b>	<b>79.0</b>	<b>80.2</b>
Male	81.5	80.8	85.2	86.5
Female	69.2	68.9	72.9	74.1
<b>Labour force population (in thousands)</b>	<b>21,169</b>	<b>26,075</b>	<b>41,369</b>	<b>52,189</b>
Male	11,059	13,682	22,010	27,918
Female	10,110	12,393	19,359	24,271
<b>Employed population (in thousands)</b>	<b>18,409</b>	<b>22,338</b>	<b>34,902</b>	<b>44,516</b>
Male	9,532	11,615	18,432	23,673
Female	8,877	10,723	16,470	20,843
<b>Unemployed population (in thousands)</b>	<b>2,761</b>	<b>3,736</b>	<b>6,467</b>	<b>7,673</b>
Male	1,527	2,067	3,578	4,245
Female	1,233	1,669	2,889	3,428
<b>Unemployment rate (%)</b>	<b>13.0</b>	<b>14.3</b>	<b>15.6</b>	<b>14.7</b>
Male	13.8	15.1	16.3	15.2
Female	12.2	13.5	14.9	14.1

Between 2018 and 2093, the total population of Tanzania Mainland is expected to be multiplied by around 5, while the working-age population (15–69) is expected to be multiplied by more than 6. The general labour force participation rates are assumed to increase continuously for both sexes during the period 2018–93, from 81.5 to 85.1 per cent for males and from 69.2 to 71.8 per cent for females. Although the increase in the labour force population from 2018 to 2093 is expected to have an impact on employment growth over the projection period, the combination of sustained growth of the economy and the gradual increase in productivity per worker should contribute to stabilize the unemployment rates between 13 and 15 per cent for most of the projection years.

### **2.2.2 Employment by sector (private and public)**

As part of the macroeconomic model, it is assumed that the proportion of all national wages in the formal economy will increase from its current estimated state of approximately 19 per cent to a new level of approximately 23 per cent in the first 4 years of the projection. It is assumed that this increase of wages will be caused by an increase of workers in the formal sector instead of an increase of salary of workers in the formal sector. The impact of the increase of worker in the formal sector is then distributed as such:

- Increase due to private sector worker: 2/3
- Increase due to public sector worker: 1/3

As such, the number of workers in the formal sector of the economy is increasing at a fast rate at the beginning of the projection period. However, it is important to remember that this assumption has not a significant impact of the financial situation of WCF. An increase in the number of insured members (or potential insured members) will lead not only to higher revenues (higher contribution) but will also lead to higher expenses (higher benefit payment, higher administration expenses). Hence, based on the current assumption (see Appendix 4), the financial situation of the insurance scheme is not impacted significantly by this assumption.

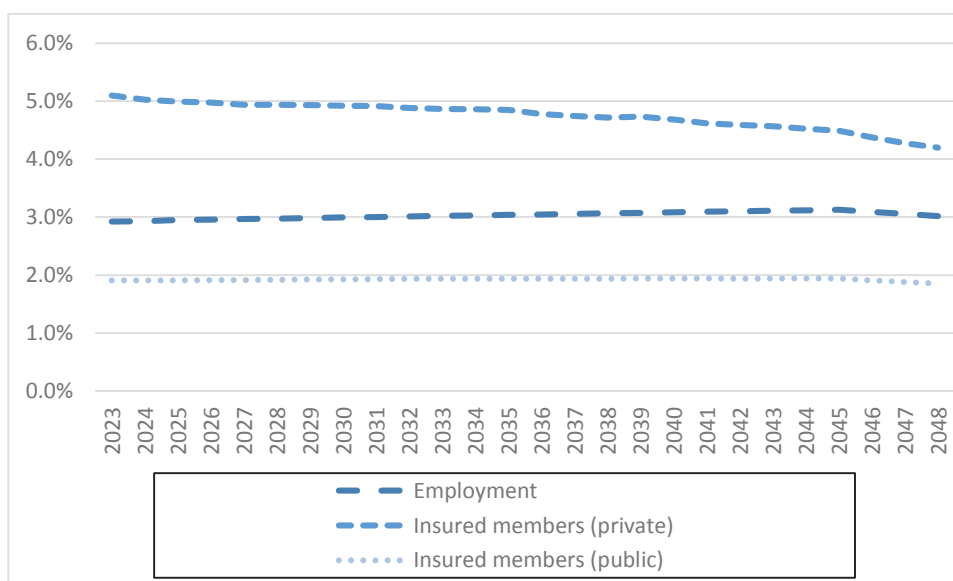
One particular finding could be useful in assessing the projected employment in the public and parastatal sectors: the number of insured members covered under the Public Service Social Security Fund working in the public and parastatal sectors has increased relatively in line with the employed population between 2013 and 2018<sup>8</sup>. Furthermore, according to the IMF<sup>9</sup>, wages and salaries in the public sector are projected to remain stable in percentage of GDP from 2018 to 2021. This suggests that the number of public and parastatal workers will continue to increase in line with the general employment growth in the economy over the short-term run.

Although the above-mentioned assumptions are consistent with the IMF estimates of the projected government expenditures for financial years 2018 to 2021, it remains difficult to project the number of workers in the public and parastatal sectors over the long-term run.

As part of the macroeconomic framework, it is assumed that the proportion of workers in the formal sector for civil servants will increase at a slower rate in the future. The growth rate of workers in the public section will gradually reduce between 2025 and 2045. From 2045, the number of workers in the public and parastatal sectors will increase at a rate equal to half the growth rate of the total employed population.

Figure 2.3 presents the projected growth rate of the number of insured members by sector (private and public) over the projection period.

**Figure 2.3 Growth rate of the number of insured members and employment, 2020-2048**



<sup>8</sup> Report to the Government represented by the Social Security Regulatory Authority, Actuarial Valuation of the Public Service Social Security Fund as of 1 August 2018, Section 3.2.2

<sup>9</sup> IMF Country Report No. 18/11 - Seventh Review Under the Policy Support Instrument (January 2018) <https://www.imf.org/en/Publications/CR/Issues/2018/01/16/Republic-of-Tanzania-Seventh-Review-Under-the-Policy-Support-Instrument-Press-Release-Staff-45565>

### 2.2.3 Inflation

The inflation forecasts from both the Economist Intelligence Unit (EIU) and the International Monetary Fund (IMF) are presented in Table 2.8.

The inflation rate has been assumed to reach 5.0 per cent in 2019, 5.1 per cent in 2020, 5.2 per cent in 2021-2023 and decrease gradually thereafter to reach the authorities' medium-term target of 5.0 per cent<sup>10</sup> annually from 2025.

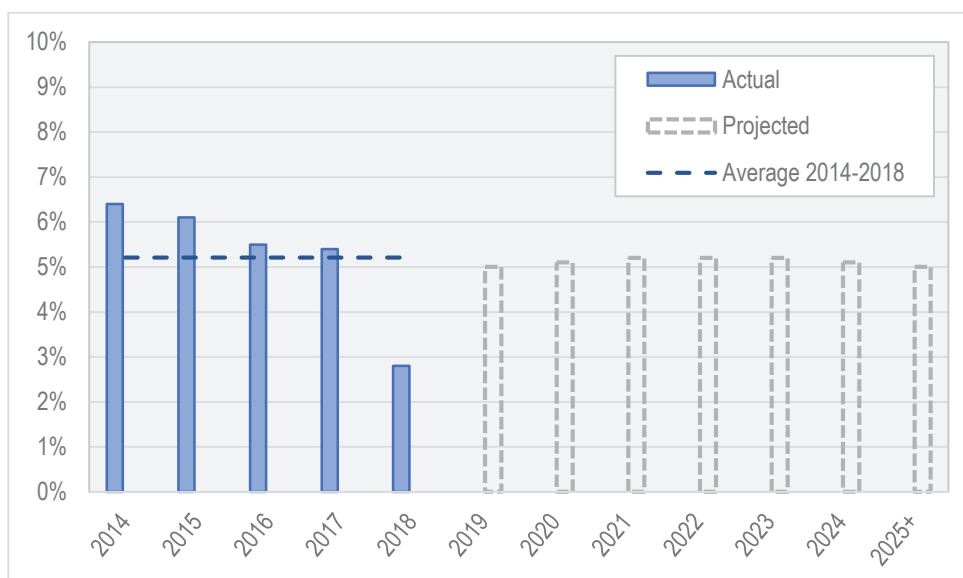
**Table 2.8 Inflation forecast (EIU, IMF and assumed) (2019-2093) (in percentage)**

	2019	2020	2021	2022	2023	2024	2025+
<b>EIU</b>	5.2	5.1	5.5	5.3	5.4	n.a.	n.a.
<b>IMF</b>	4.7	5.0	5.0	5.0	5.0	n.a.	n.a.
<b>Assumption</b>	5.0	5.1	5.2	5.2	5.2	5.1	5.0

n.a. = not available

During the five years preceding the actuarial valuation (financial years 2014 to 2018 inclusively), the Consumer Price Index (CPI) increased annually at an average growth rate of 5.2 per cent. Figure 2.4 presents the CPI growth rates from 2014 to 2018, along with the assumed projection.

**Figure 2.4 CPI for 2013–2018, and projected 2019-2025+**



### 2.2.4 Salary Growth Rate

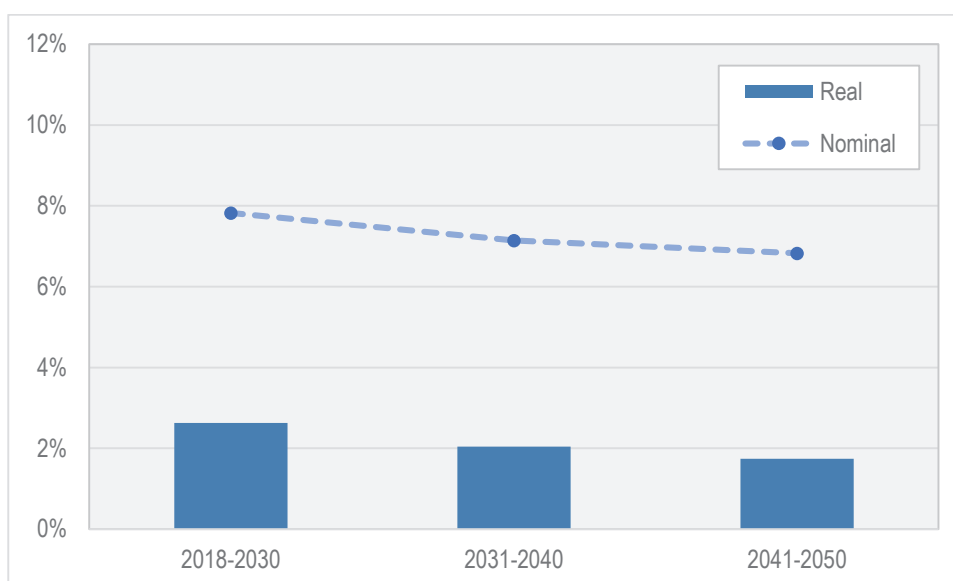
The annual increase in the remuneration of an insured person consists of three components: the changes in the cost of living (i.e. CPI), the general economic productivity increase and the increase in personal productivity for work experience and seniority.

In this actuarial valuation, the average earning of WCF members is assumed to increase in line with the general wages in the economy.

Figure 2.5 presents the projected wage growth rate of workers in the general economy and the projected growth rate in the average insurable earnings of WCF members, both in real and nominal terms.

<sup>10</sup> According to the IMF *Seventh Review under the Policy Support Instrument* published in January 2018.

**Figure 2.5 Projected nominal and real salary growth rate, general economy and WCF insured members, 2018-2050**



# 3

## 3 VALUATION OF EMPLOYMENT INJURY BENEFITS

### 3.1 INTRODUCTION: PURPOSE OF THE VALUATION

The purpose of the valuation is, first of all, to analyse the past experiences of the scheme. This analysis is conducted with due reference to the financial system applied to each individual benefit. The analysis includes an assessment of whether and to what extent benefits have been met by available financial resources, i.e. contributions equal to 1.0 per cent of insurable salaries of private-sector workers and 0.5 per cent of insurable salaries of public-sector workers and investment returns on the scheme assets. It should also assess the amount of the technical reserve required on the valuation date for future payments of existing benefits and compare it to the amount of the reserves held by the scheme.

The generic ILO-EII model is adjusted to reflect the current benefit design of the WCF scheme. Firstly, the model projects the number of expected incidences by type, namely work-related non-commuting accident, occupational disease and commuting accident for every future year of the projection. Then the number of different types of claims such as medical benefit, short-term disability, long-term disability and death benefits (funeral benefits, widow(er)'s pension, orphans' pension and parents' pension, are calculated by multiplying probabilities to the number of these injured workers. It is important to note that these benefits are not mutually exclusive, i.e. a single injured worker may be entitled to more than one type of benefit. This model is in line with the legislation and the administration of the WCF. Details of the model are explained in Appendix 3 and details of assumptions and data are shown in Appendix 4.

Demographic and financial projections are provided for a period of 30 years. Various aspects of the scheme design will be analysed and commented on in this report following the actuarial assessment on a status quo basis. Based on the analysis, recommendations are presented in Section 4.

### 3.2 FINANCIAL SYSTEMS FOR EMPLOYMENT INJURY BENEFITS

A financial system means the arrangement according to which resources are raised to meet the cost of benefits and administration. In general, the financial system for short-term benefits and the one for long-term benefits is different.

#### 3.2.1 Short-term benefits

Short-term benefits of Employment Injury Benefits include medical and rehabilitation benefits, temporary disability benefits and funeral benefits. The annual expenditure of these benefits expressed as a percentage of the total insurable earnings is expected to stabilize within a relatively short time after the scheme starts its operation. The Pay-As-You-Go (PAYG) system or the annual



assessment system is a financial system usually adopted to the finance of these benefits. Under the PAYG system, the contribution rate is set so that the annual contribution income in a given year should be equal to the annual benefit expenditure and a small margin to build up a contingency reserve for meeting unexpected variations in income and expenditure.

The accounting rules and its financial statements of the WCF are on accrual basis, namely annual benefit expenditures include both payments made during the year for incidents occurring in the financial year and accruals on reported but claims not yet paid and a provision for unreported claims<sup>11</sup>. The actuarial model has been adjusted in line with this accounting method. In practice, the model projects the sum of payments made, accruals for claims reported but not yet paid and provisions for unreported claims and each component is calculated by using an observed pattern between these three components.

### **3.2.2 Long-term benefits**

Long-term benefits include permanent disability benefits and dependents' benefits which are provided basically in the form of life-time pensions, or in some cases in the form of lump sum. The amount of a pension depends on the insurable earnings and, in the case of permanent disability benefits, on the degree of disability, but does not depend on the past contributing period or service of the beneficiary. In contrast to short-term benefits, the total annual payments of long-term benefits as a percentage of the total insurable earnings is expected to grow steadily and continuously for several decades until the scheme attains maturity. However, present value of benefits, namely amount necessary to meet future periodical payments of newly awarded benefits in a fiscal year, as a percentage of the insurable earnings in the same fiscal year, is expected to stabilize much sooner.

A financial system usually applied to long-term employment injury benefits is the terminal funding system, sometimes called the system of assessment of constituent capitals. The contribution rate is set such that the expected contribution income in a given year should equal the capitalized present value of the future benefits awarded in that year. In other words, all the new benefits incurred in a year are fully funded during that year. This leads to the build-up of a technical reserve, or more precisely a liability, which, in theory, should at any time be equal to the capitalized value of all pensions in payment so long as the assumptions for the calculation hold. A margin is added in order to constitute a contingency reserve for unexpected variations of income and expenditure. The accounting rules applied by the WCF suggest that the intention is to recognize the cost of all pensions that are expected to be paid with respect to incidents occurred up the end of the year. The difference with terminal funding as described above in general terms is small as both methods calculate the present value of pensions, which is the important distinction with PAYG. Terminal funding implies that expenditures of a given year are related to pensions that start to be paid in that year while under full-funding, the present value of pensions that will be paid for incidents occurring in a year are accounted in the year of the incident. Generally, several months or even years elapse between the incident and the start of a PTD pension. For survivors, the delay is generally short. The difference between terminal funding and full-funding is the liability for pensions related to incidents that have occurred but for which the pension has not started to be paid. This part is sometimes referred to as Incurred but not reported claims (IBNR).<sup>12</sup>

### **3.2.3 Administration costs**

Administration costs are projected by applying a coefficient to contributions. The method and assumptions for the projection of administration costs are described in Appendix 4.

## **3.3 PROSPECTIVE COST ANALYSIS**

Demographic and financial projections were carried out according to the methodology and assumptions described in Appendices 3 and 4. It has been assumed that the non-death incidence rates of employment-related non-commuting accidents, occupational diseases and commuting

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<sup>11</sup> This accounting approach is referred to as incurred basis as opposed to cash basis.

<sup>12</sup> In the case of pensions, one must be cautious with that expression. It can be used to designate either all pensions that have not started to be paid (including those for which the incidents were reported) or only pensions for claims not yet reported.

accident would increase in 2030 five times as much as the current ones. It is assumed that the severity of disability cases, expressed as disability degrees, as well as the incidence rates of deaths are assumed to remain constant throughout the projection period.

### **3.3.1 Demographic projections**

Table 3.1 presents the demographic projections of long-term beneficiaries, namely the numbers of disability and survivors' pensioners at the end of each year and the number of temporary disability benefits during the year. The demographic ratio is a ratio of the number of pensioners to the number of active insured persons. The latter is estimated in the insured population model as explained in Section 2. Table 3.2 presents another set of demographic projections of beneficiaries for new incidents occurring during the year, which is used for the calculations of the present value of new incidents occurring during the year.

As the system is not yet fully mature, a steady increase of the demographic ratio of long-term benefits is expected for decades.

**Table 3.1 Demographic projections of employment injury benefits** (Stock of pensioners and temporary disablement)

Year	Number of contributors	Number of beneficiaries				% per active insured			
		PD Pensions	Dependants		TD Benefits	PD Pensions	Dependants		TD Benefits
			Widow (er)s	Other dependants			Widow (er)s	Other dependants	
17-18	1,076,960	19	20	33	0	0.00	0.00	0.00	0.00
18-19	1,152,296	86	50	136	1,219	0.01	0.00	0.01	0.11
19-20	1,222,029	174	83	246	1,622	0.01	0.01	0.02	0.13
20-21	1,292,938	286	118	363	2,059	0.02	0.01	0.03	0.16
21-22	1,362,748	424	154	488	2,536	0.03	0.01	0.04	0.19
22-23	1,416,385	590	192	619	3,048	0.04	0.01	0.04	0.22
23-24	1,471,784	783	232	752	3,556	0.05	0.02	0.05	0.24
24-25	1,529,362	1,005	274	885	4,098	0.07	0.02	0.06	0.27
25-26	1,589,375	1,259	317	1,015	4,677	0.08	0.02	0.06	0.29
26-27	1,651,662	1,545	361	1,136	5,295	0.09	0.02	0.07	0.32
27-28	1,716,722	1,867	408	1,251	5,954	0.11	0.02	0.07	0.35
28-29	1,784,626	2,227	456	1,356	6,657	0.12	0.03	0.08	0.37
29-30	1,855,434	2,627	506	1,452	7,407	0.14	0.03	0.08	0.40
30-31	1,929,326	3,041	558	1,541	7,694	0.16	0.03	0.08	0.40
31-32	2,006,096	3,470	612	1,623	7,994	0.17	0.03	0.08	0.40
32-33	2,086,053	3,914	668	1,703	8,306	0.19	0.03	0.08	0.40
37-38	2,536,009	6,388	984	2,133	10,072	0.25	0.04	0.08	0.40
42-43	3,077,665	9,348	1,364	2,644	12,209	0.30	0.04	0.09	0.40
47-48	3,708,329	12,883	1,819	3,247	14,772	0.35	0.05	0.09	0.40

**Table 3.2 Demographic projections of newly awarded employment injury benefits during the year for pensions and funeral benefits**

Year	Number of contributors	PD pensions	PD Lump sums	Dependents		Funeral benefits
				Widow(er)s	Other dependants	
17-18	1,076,960					
18-19	1,152,296	67	262	31	104	36
19-20	1,222,029	89	347	33	112	39
20-21	1,292,938	113	440	35	120	41
21-22	1,362,748	140	541	37	127	44
22-23	1,416,385	169	649	39	134	46
23-24	1,471,784	197	756	40	139	48
24-25	1,529,362	228	870	42	145	50
25-26	1,589,375	260	992	44	152	52
26-27	1,651,662	295	1,121	46	158	54
27-28	1,716,722	332	1,258	48	164	56
28-29	1,784,626	372	1,405	50	171	59
29-30	1,855,434	415	1,561	52	178	61
30-31	1,929,326	432	1,618	54	185	64
31-32	2,006,096	449	1,679	56	193	67
32-33	2,086,053	468	1,741	59	201	69
37-38	2,536,009	572	2,091	72	246	85
42-43	3,077,665	698	2,508	88	300	105
47-48	3,708,329	848	3,002	108	365	128

### 3.3.2 Financial projections

Table 3.4 presents benefits cost on an incurred basis. It should be noted that the long-term benefit cost is calculated as the present value of pension payments and thus includes future benefit cost expressed as a lump sum amount necessary for future payments of pensions related to incidents occurring during the year on an accrual basis.

**Table 3.3 Projection of benefits cost expenditures<sup>13</sup>** (millions TZS)

Year	Insurable earnings	PD Pensions	PD Lump sums	Dependants		Funeral benefits	TD	Medical	Total cost of benefits	Benefits cost as % of insurable earnings
				Widow (er)s	Other dependants					
18-19	14,000,808	9,741	1,715	4,180	2,155	15	2,035	365	20,206	0.14
19-20	15,373,702	13,524	2,366	4,645	2,415	17	2,809	507	26,283	0.17
20-21	17,100,243	18,129	3,159	5,188	2,706	0	3,756	674	33,632	0.20
21-22	19,058,709	23,720	4,110	5,814	3,039	21	4,899	871	42,474	0.22
22-23	21,064,586	30,461	5,241	6,522	3,415	23	6,271	1,099	53,031	0.25
23-24	23,396,506	38,161	6,508	7,246	3,797	25	7,826	1,345	64,909	0.28
24-25	26,120,506	47,453	8,013	8,084	4,234	28	9,695	1,626	79,132	0.30
25-26	29,140,284	58,352	9,764	9,011	4,717	31	11,879	1,944	95,698	0.33
26-27	32,482,637	71,111	11,792	10,038	5,250	33	14,425	2,306	114,955	0.35
27-28	36,217,340	86,073	14,148	11,185	5,843	37	17,399	2,716	137,400	0.38
28-29	40,390,445	103,599	16,880	12,465	6,504	40	20,867	3,181	163,535	0.40
29-30	45,053,824	124,098	20,045	13,892	7,240	44	24,906	3,708	193,934	0.43
30-31	50,266,918	138,781	22,227	15,486	8,062	48	27,747	4,036	216,387	0.43
31-32	56,088,017	155,241	24,652	17,267	8,978	52	30,912	4,392	241,496	0.43
32-33	62,592,189	173,670	27,343	19,249	9,997	57	34,445	4,781	269,543	0.43
37-38	108,458,068	304,892	45,765	32,852	17,058	90	59,253	7,298	467,207	0.43
42-43	187,141,975	533,168	75,748	55,217	28,836	141	100,980	11,112	805,203	0.43
47-48	318,793,607	917,995	123,839	91,451	47,792	219	169,257	16,889	1,367,442	0.43

<sup>13</sup> Cost for permanent disability pensions as well as survivors' pensions is the present value of the of pensions to be paid for incidents occurring during the year based on terminal funding method while the cost for other benefits is the annual cost of benefits to be paid during the year based on the PAYG financing method.

The benefit cost increases from 0.14 percent of insurable earnings to 0.43 when the ultimate level of incidence has been reached. The share of dependents benefits for deceased workers gradually decreases over the projection period because the death incidence rate is kept constant while the non-death incidence rate is assumed to gradually increase up to the five times as much as the current one. In order to assess the contribution rate required to cover the total cost of the scheme, the administrative expenditures must be assessed. For the base scenario, it has been assumed that they represent 17.3 percent of the current contributions. Given the relative weight of the public and private sector, the equivalent percentage in terms of insurable earnings, namely the PAYG cost for administration, converges to 0.16 percent. The average contribution rate, as a summation of the benefit cost and the administration cost, converges to around 0.59 percent. Further analysis is provided to determine appropriate contribution rates by sector.

Table 3.4 presents a simplified projection of the fund based on the current contribution rates. The assets accumulate with the cash flow and the benefits liabilities are generated by the model. Liabilities implicitly include the present value of pensions for claims that have occurred up to the valuation date including the unreported ones. The liability for accruals in each year are treated in reduction to assets instead of being presented as liability. The starting assets are net of liabilities that are not related to benefits. The liability at June 2018 have been adjusted to include the present value of pensions whether they have started to be paid at that time or not. Section 4 will discuss the determination of the benefits liability in the financial statement. The expression “free reserve” is used to designate the difference between total assets and liabilities. This expression has been considered more appropriate than “surplus”.

Table 3.4 Fund projection (millions TZS)

Year	Contribution income	Investment income after tax	Benefit payments	Administrative expenses	End of year assets	Benefit liabilities	Free reserve	Funding ratio
17-18					217,783	10,813	206,970	20.1
18-19	114,994	15,734	4,900	19,894	323,718	19,386	304,331	16.7
19-20	126,840	22,680	7,286	21,943	444,008	40,328	403,680	11.0
20-21	141,728	30,795	10,237	24,519	581,775	67,147	514,628	8.7
21-22	158,714	39,655	13,840	27,458	738,847	101,091	637,756	7.3
22-23	176,093	49,699	18,203	30,464	915,973	143,573	772,400	6.4
23-24	196,325	60,054	23,255	33,964	1,115,133	195,694	919,440	5.7
24-25	220,003	71,420	29,302	38,061	1,339,194	259,297	1,079,897	5.2
25-26	246,346	85,297	36,430	42,618	1,591,789	336,397	1,255,392	4.7
26-27	275,603	100,921	44,789	47,679	1,875,845	429,399	1,446,446	4.4
27-28	308,401	118,477	54,595	53,353	2,194,774	541,057	1,653,718	4.1
28-29	345,163	138,172	66,071	59,713	2,552,325	674,573	1,877,752	3.8
29-30	386,371	160,236	79,491	66,842	2,952,599	833,668	2,118,931	3.5
30-31	432,576	185,033	91,280	74,836	3,404,093	1,013,383	2,390,710	3.4
31-32	484,313	212,997	104,515	83,786	3,913,101	1,216,215	2,696,886	3.2
32-33	542,283	244,515	119,374	93,815	4,486,710	1,444,928	3,041,782	3.1
37-38	954,434	472,737	225,566	165,117	8,637,660	3,098,018	5,539,642	2.8
42-43	1,669,522	882,773	410,568	288,827	16,087,780	6,041,873	10,045,907	2.7
47-48	2,877,010	1,610,189	726,230	497,723	29,285,233	11,178,172	18,107,061	2.6

The ratio of assets to benefits liabilities starts at a high level and converges to 2.6 at the end of the projection period of thirty years. A ratio of 1 and above indicates that the plan is fully funded. The adequate level of funding is a policy issue to be agreed by stakeholders and the ratio should not reach excessive levels. A balance should be achieved between objectives related to security of benefits, equity among different generations of employers and stability of contributions. In public EII schemes, a funding policy should set the target of the funding ratio and contribution rates should be adjusted in case it is expected that the funding ratio will deviate from the target. The funding ratio of public schemes usually should not go beyond 1.2, although possible fluctuations in income and expenditure and the stability of contributions should be well taken care of.

Given that the WCF is at an early stage of the implementation and there is substantial uncertainty about the mid and long-term trends, it is still too early to put in place a funding policy that would be applicable now and in the future. Although the contribution rates seem to be reduced in the short-term given the size of the free reserves, prudence is recommended in order to avoid significant increases if financially unfavourable experiences emerge.

If the assumptions regarding the incidence rates of events materialize, the projections indicate that the average contribution rate will converge to 0.59 percent. As contributions rates are different by sector, the contribution rate for each sector should take into consideration the financial situation of each sector. It is understood that WCF has the intention to refine its rate setting system and introduce rating by industry in the future. Experiences and data for a short time since the scheme implementation do not allow to make recommendations in the matter. Nevertheless, it remains possible to seek some equity within the current framework. The contribution rates will be discussed in Section 4.

Table 3.5 shows the cost allocation of the benefit paid by type of incidence for selected years. Table 3.6 shows the projected number of incidents per type.

**Table 3.5 Allocation of benefit amount per type of incidence (% of total benefits paid)**

Year	Accident	Disease	Commuting
18-19	68	1	31
22-23	67	1	32
27-28	67	1	32
32-33	66	1	33
37-38	66	1	33
42-43	65	1	34
47-48	65	2	33

Table 3.5 shows that the majority of the cost, almost two thirds, of the scheme are related to the workplace accidents. The other part of the cost is related to the commuting accident<sup>14</sup> (about one third). Occupational disease compensations are financially marginal. Based on assumptions for projections, these ratios are expected to remain constant throughout the projection period.

Table 3.6 shows the projected number of incidents per type.

<sup>14</sup> Commuting accidents refers to accidents that take place as part of the work (e.g. truck accident for a truck driver), as well as accident that may take place between the residence and the workplace at the beginning and the end of each work shift.



**Table 3.6 Projected number of incidents per type**

Year	Accident	Disease	Commuting
18-19	932	15	340
22-23	2,311	39	865
27-28	4,486	78	1,714
32-33	6,219	111	2,421
37-38	7,491	139	2,971
42-43	9,015	173	3,643
47-48	10,844	215	4,440

### 3.4 SENSITIVITY ANALYSIS

Any actuarial valuation cannot project the future with perfect accuracy as projections are, even with sophistications, simplified mapping of realities with assumptions which are not perfectly realized. When using a deterministic model, sensitivity analysis is carried out to show the potential variability of results. This can be performed on assumptions that have the most impact on future costs or, alternatively, on those assumptions that present a lower level of credibility because of a lack of data.

#### 3.4.1 Rate of return

The current assumption on the rate of return is based on the past experience of the other social security schemes of Tanzania and the real rate of return objective of the investment policy of WCF. A sensitivity scenario assumes the real rate of return of the fund as 0 per cent. Table 3.7 shows key results of this sensitivity scenario and compares it to the base scenario shown in Section 3.3 of this report.

**Table 3.7 Key results of sensitivity scenario – Rate of return**

Year	Base scenario		Sensitivity scenario	
	Total cost of benefits (in million TZS)	Benefit cost as % of insurable earnings	Total cost of benefits (in million TZS)	Benefit cost as % of insurable earnings
18-19	20,206	0.14	23,528	0.17
22-23	53,031	0.25	61,779	0.29
27-28	137,400	0.38	160,358	0.44
32-33	269,543	0.43	315,229	0.50
37-38	467,207	0.43	547,563	0.50
42-43	805,203	0.43	945,771	0.51
47-48	1,367,442	0.43	1,609,092	0.50

The sensitivity scenario increases the cost of the benefits by an average of 17 percent for the duration of the projection period.

In this sensitivity scenario, the ratio of total costs (benefits and administrative expenses) as percentage of insurable earnings will converge to 0.66 percent, which is an increase of 0.07 percent compared to the original scenario of 0.59 percent.

### 3.4.2 Incidence rate

One of the most important assumption used for the actuarial projection of WCF is the incidence rate. This assumption determines the number of new beneficiary cases. These projected benefits to be paid play an important role in the determination of the free reserve and the appropriate contribution rate. Two sensitivity scenarios were developed for this specific assumption. Table 3.8 shows the change in this assumption, with a comparison to the original scenario assumption.

**Table 3.8 Change in incidence rate assumption**

Assumption	Less incidents scenario	Base scenario	More incidents scenario
Increase factor applicable to accident rate in 2030	3	5	7
Increase factor applicable to disease rate in 2030	3	5	7
Increase factor applicable to commuting accident rate in 2030	3	5	7
Proportion of mortality in 2030 expressed as % of ratio of 2018	75%	100%	125%

Table 3.9 shows key results of these sensitivity scenarios and compare them to the base scenario shown in Section 3.3 of this report.

**Table 3.9 Key results of sensitivity scenario – Incidence rate**

Year	Less incidents scenario		Base scenario		More incidents scenario	
	Total cost of benefits (in million TZS)	Benefit cost as % of insurable earnings	Total cost of benefits (in million TZS)	Benefit cost as % of insurable earnings	Total cost of benefits (in million TZS)	Benefit cost as % of insurable earnings
18-19	18,745	0.13	20,206	0.14	21,667	0.15
22-23	42,004	0.20	53,031	0.25	64,057	0.30
27-28	100,601	0.28	137,400	0.38	174,198	0.48
32-33	195,360	0.31	269,543	0.43	343,734	0.55
37-38	342,252	0.32	467,207	0.43	592,176	0.55
42-43	595,950	0.32	805,203	0.43	1,014,480	0.54
47-48	1,019,100	0.32	1,367,442	0.43	1,715,824	0.54

The sensitivity scenario where there are less incidents decreases the cost of the benefits by an average of 23 percent for the duration of the projection period. The sensitivity scenario where there are more incidents increases the cost of the benefits by an average of 23 percent for the duration of the projection period.

# 4

## 4 ISSUES AND RECOMMENDATIONS

This section discusses various aspects of the operation of the scheme with respect to both its compensation and financing functions.

### 4.1 CONTRIBUTION RATES

This section presents three scenarios for the setting of contribution rates until the next actuarial valuation. They are differentiated by the fact that one of them maintains a difference in rates between sectors while the others provide a single rate for all.

It is important to remember that the proposed changes could technically be contemplated for 1 July 2020. At the time of the writing of this report, Regulation regarding the contribution rate applicable for financial year 2019-2020 is already in force and would require significant changes (budget of WCF, change in in-force regulation). Following discussion with WCF, it is more realistic to consider the proposed changes to contribution rate by 1 July 2020.

#### 4.1.1 Maintenance of differentiated rate by sector

As part of the discussion of contribution rates, it has been relevant to develop some indicators by sector in order to identify whether there are differences in the level of risk of each one. Given the short observation period since the scheme implementation and low statistical credibility of the database, the results should be used with caution. Table 4.1 presents key indicators by sector which were introduced in Tables 3.3 and 3.4 in order to guide a short-term rate setting policy.

**Table 4.1 Financial indicators by sectors**

Year	Private sector			Public sector	
	Contribution rate: 1%			Contribution rate: 0.5%	
	Total cost as % of insurable earnings	Funding ratio (contribution rate: 1%)		Total cost as % of insurable earnings	Funding ratio (contribution rate: 0.5%)
18-19	0.30	17.6		0.25	14.2
19-20	0.33	12.0		0.28	8.3
22-23	0.42	7.1		0.34	4.4
27-28	0.56	4.5		0.45	2.6
32-33	0.62	3.5		0.49	1.9
37-38	0.61	3.1		0.49	1.7
42-43	0.61	2.9		0.49	1.5
47-48	0.61	2.9		0.49	1.4

Table 4.1 highlights the following:

- The difference in the funding ratio between the two sectors is important.
- There is a difference in the total cost as percentage of insurable earnings with the public sector cost being lower, corresponding to 80 (0.49/0.61) percent of that of the private.

It seems clear that the WCF has considerable room for maneuvering in establishing short-term rates in the next few years while facing a significant problem because of the uncertainty of the long-term cost of the scheme. There are good reasons to believe that uncertainty will be lifted in the next actuarial valuation. The WCF faces a major dilemma that cannot be solved solely on the basis of actuarial considerations. On the one hand, the financial situation seen from all angles justifies a reduction in the contribution rate, but on the other hand, a too large reduction could lead to a medium-term weakening of the financial health while an insufficient reduction could lead to the accumulation of free reserves considered excessive. It would be a situation that would create instability and undermine the credibility of the scheme. Here are some guidelines for the WCF to make a decision on contribution rates.

For the public sector, the amount of free reserves is important, and the current rate covers the financial needs if the long-term assumptions are realized. In the latter case, the current free reserves would not be amortized at the end of the projection period as the funding ratio would decrease to 1.4 if the contribution rate is kept at 0.50 percent. It is not recommended to decrease the rate in order to amortize the free reserves more rapidly because of long-term uncertainty, especially on incident rates. The ILO recommends keeping the contribution rate at its current level of 0.50 percent.

The free reserve of the private sector is also important, and the funding ratio of 2.9 is at the end of the projection period is considered as excessive. It would never converge to one because the projected annual cost is lower than the current contribution rate. However, one has to keep in mind that the annual trend of this long-term cost is uncertain. In this context, the decision of the WCF must be based on the best compromise between the different elements to be considered. There does not seem to be any contraindication to lower the rate to that corresponding to the long-term cost trend of 0.60 percent of insurable earnings projected in this valuation. Although an upcoming actuarial valuation would reveal that the long-term cost is higher than that projected in this valuation, it is unlikely that a sudden and significant increase in the contribution rate will be needed. If all assumptions are realized, the funding ratio at the end of the projection period would reach an acceptable level at about 1.2 with this contribution rate. The ILO recommends setting the contribution rate of the private sector at 0.6 percent of the insurable earnings.

Table 4.2 presents the funding ratio for the public sector resulting from the contribution rates of this scenario if they are maintained over the projection period. For the public sector, results of Table 4.1 should be referred.

**Table 4.2 Projected funding ratio –possible contribution rate private sector in 2020-2021**

Year	Recommended contribution rate as % of insurable earnings	Funding ratio
18-19	1.0	17.6
19-20	1.0	12.0
20-21	0.6	8.6
22-23	0.6	5.5
27-28	0.6	2.8
32-33	0.6	1.9
37-38	0.6	1.5
42-43	0.6	1.3
47-48	0.6	1.2

Table 4.3 shows the financial projection of the scheme based on the proposed change in contribution rate.

**Table 4.3 Fund projection – Contribution rate of 0.6 per cent for private sector starting in 2020-2021** (millions TZS)

Year	Contribution income	Investment income after tax	Benefit payments	Administrative expenses	End of year assets	Benefit liabilities	Free reserve	Funding ratio
17-18					217,783	10,813	206,970	20.1
18-19	114,994	15,734	4,900	19,894	323,718	19,386	304,331	16.7
19-20	126,840	22,680	7,286	21,943	444,008	40,328	403,680	11.0
20-21	96,747	29,421	10,237	24,519	535,420	67,147	468,273	8.0
21-22	107,978	35,232	13,840	27,458	637,332	101,091	536,241	6.3
22-23	119,477	41,677	18,203	30,464	749,819	143,573	606,246	5.2
23-24	132,851	48,012	23,255	33,964	873,462	195,694	677,769	4.5
24-25	148,483	54,806	29,302	38,061	1,009,388	259,297	750,090	3.9
25-26	165,830	63,129	36,430	42,618	1,159,299	336,397	822,902	3.4
26-27	185,051	72,295	44,789	47,679	1,324,176	429,399	894,777	3.1
27-28	206,550	82,366	54,595	53,353	1,505,143	541,057	964,087	2.8
28-29	230,594	93,407	66,071	59,713	1,703,360	674,573	1,028,787	2.5
29-30	257,489	105,488	79,491	66,842	1,920,005	833,668	1,086,337	2.3
30-31	287,583	118,791	91,280	74,836	2,160,263	1,013,383	1,146,881	2.1
31-32	321,215	133,545	104,515	83,786	2,426,722	1,216,215	1,210,507	2.0
32-33	358,825	149,909	119,374	93,815	2,722,267	1,444,928	1,277,339	1.9
37-38	624,719	262,830	225,566	165,117	4,762,054	3,098,018	1,664,036	1.5
42-43	1,082,472	452,788	410,568	288,827	8,193,578	6,041,873	2,151,704	1.4
47-48	1,850,576	771,611	726,230	497,723	13,949,672	11,178,172	2,771,500	1.2

It is understood that the period of application of the recommended rates under this scenario extends until the next valuation is completed, when they may be revised.

As the WCF intends to implement an industry rating system that would consider the risk of industries, the surplus will provide options for a smooth transition between the current rates and the rates that properly reflect the risk of industries, especially for the risky industries. It can be expected that the contribution rates of high risk would have to be increased substantially while that of low risk ones would be decreased.

#### **4.1.2 Single rate of 0.5 per cent for all sectors starting in 2020-2021**

One scenario that was requested to be studied as part of this actuarial valuation by WCF to begin national discussions on potential change in contribution rate in the future was the usage of a single contribution rate amongst both sectors. The uniform contribution rate that was analyzed under the first scenario is 0.5 of insurable earnings for all covered workers under WCF starting 1 July 2020. The ILO feels that this scenario could be justifiable based on the current financial situation of the scheme, as no rate increase is required for the public sector. Hence, this scenario would not impose a rate increase in the public sector.

In this first alternate scenario on the contribution rate, the free reserve is used at a faster rate than in the previous scenario, since the level of contribution rate for the private sector is below the required level to maintain a funding ratio above 1.0 for the private sector. The free reserve, that is the value of the assets over the value of the liabilities, will be completely exhausted during the financial year 2044-2045. This is an important fact that the social partners in Tanzania must consider when considering the application of this scenario. However, at no point during the projection period (up to financial year 2048-2049) would the value of the invested funds be insufficient to provide the required benefits to the victims of occupational accidents and diseases. At the end of the projection period, the funding ratio would reach a level around 0.90. This funding ratio would not be consistent with the funding system and the rate would have to be increased to 0.6 in order to maintain it above 1 for the full projection period. Table 4.4 shows the funding ratio under this option for selected years.

**Table 4.4 Projected funding ratio –contribution rate of 0.5 per cent for both sectors in 2020-2021**

Year	Contribution rate for both sectors	Funding ratio
20-21	0.5	7.8
22-23	0.5	4.9
27-28	0.5	2.5
32-33	0.5	1.6
37-38	0.5	1.2
42-43	0.5	1.0
47-48	0.5	0.9

Since the scheme currently has a very important amount of free reserve, it may be acceptable to amortize it (i.e. lowering the contribution rate) over a shorter period in order to mitigate inter-generational transfer between employers. Employers have a shorter lifespan than workers and employers bear all the cost related to this EII scheme. It should be understood that the rate should eventually be increased by 2044-2045 in order to avoid that the funding ratio falls below 1.

Decreasing the contribution rate of the private sector to that of the public sector may be perceived by employers of the private sector as a recognition that the rate was set at a too high level in the first years and that the risk is the same in both sectors, though this does not seem to be the case. From the governance point of view, it is still important to collect receivable contributions.

Table 4.5 shows the financial projection of the scheme based on the first scenario requested by WCF for the change in contribution rate at 0.5 per cent for both sectors in 2020-2021.

**Table 4.5 Fund projection – Contribution rate of 0.5 per cent for both sectors starting in 2020-2021 (millions TZS)**

Year	Contribution income	Investment income after tax	Benefit payments	Administrative expenses	End of year assets	Benefit liabilities	Free reserve	Funding ratio
17-18					217,783	10,813	206,970	20.1
18-19	114,994	15,734	4,900	19,894	323,718	19,386	304,331	16.7
19-20	126,840	22,680	7,286	21,943	444,008	40,328	403,680	11.0
20-21	85,501	29,078	10,237	24,519	523,831	67,147	456,684	7.8
21-22	95,294	34,126	13,840	27,458	611,953	101,091	510,862	6.1
22-23	105,323	39,671	18,203	30,464	708,280	143,573	564,707	4.9
23-24	116,983	45,001	23,255	33,964	813,044	195,694	617,351	4.2
24-25	130,603	50,652	29,302	38,061	926,936	259,297	667,639	3.6
25-26	145,701	57,587	36,430	42,618	1,051,176	336,397	714,779	3.1
26-27	162,413	65,138	44,789	47,679	1,186,259	429,399	756,860	2.8
27-28	181,087	73,338	54,595	53,353	1,332,735	541,057	791,679	2.5
28-29	201,952	82,216	66,071	59,713	1,491,119	674,573	816,546	2.2
29-30	225,269	91,801	79,491	66,842	1,661,856	833,668	828,188	2.0
30-31	251,335	102,231	91,280	74,836	1,849,306	1,013,383	835,923	1.8
31-32	280,440	113,682	104,515	83,786	2,055,128	1,216,215	838,912	1.7
32-33	312,961	126,257	119,374	93,815	2,281,156	1,444,928	836,228	1.6
37-38	542,290	210,353	225,566	165,117	3,793,152	3,098,018	695,135	1.2
42-43	935,710	345,291	410,568	288,827	6,220,027	6,041,873	178,154	1.0
47-48	1,593,968	561,967	726,230	497,723	10,115,782	11,178,172	-1,062,390	0.9

#### 4.1.3 Single rate of 0.6 per cent for all sectors starting in 2020-2021

Another scenario that was requested to be studied as part of this actuarial valuation by WCF to begin national discussions on potential change in contribution rate in the future was the usage of a single contribution rate amongst both sectors. The uniform contribution rate that was analyzed under this second scenario is 0.6 of insurable earnings for all covered workers under WCF starting 1 July 2020. The ILO feels that this scenario is difficult to justify based on the current financial situation of the scheme, as no rate increase is required for the public sector. There is no financial justification to impose an increase in the contribution rate of the public sector.

In this second alternate scenario on the contribution rate, the free reserve is used at a slower rate than in the scenario proposed by the ILO in Section 4.1.2. The free reserve will converge at 1.4 by the end of the projection period. This funding ratio is above the recommended level of 1.2 stated previously in this report. Table 4.4 shows the funding ratio under this option for selected years.

**Table 4.6 Projected funding ratio –contribution rate of 0.6 per cent for both sectors in 2020-2021**

Year	Contribution rate for both sectors	Funding ratio
20-21	0.6	8.1
22-23	0.6	5.4
27-28	0.6	2.9
32-33	0.6	2.0
37-38	0.6	1.7
42-43	0.6	1.5
47-48	0.6	1.4

Table 4.7 shows the financial projection of the scheme based on the second scenario requested by WCF for the change in contribution rate at 0.6 per cent for both sectors in 2020-2021.



Table 4.7 Fund projection – Contribution rate of 0.6 per cent for both sectors starting in 2020-2021 (millions TZS)

Year	Contribution income	Investment income after tax	Benefit payments	Administrative expenses	End of year assets	Benefit liabilities	Free reserve	Funding ratio
17-18					217,783	10,813	206,970	20.1
18-19	114,994	15,734	4,900	19,894	323,718	19,386	304,331	16.7
19-20	126,840	22,680	7,286	21,943	444,008	40,328	403,680	11.0
20-21	102,601	29,600	10,237	24,519	541,454	67,147	474,307	8.1
21-22	114,352	35,801	13,840	27,458	650,309	101,091	549,218	6.4
22-23	126,388	42,692	18,203	30,464	770,722	143,573	627,149	5.4
23-24	140,379	49,513	23,255	33,964	903,394	195,694	707,701	4.6
24-25	156,723	56,845	29,302	38,061	1,049,600	259,297	790,302	4.0
25-26	174,842	65,808	36,430	42,618	1,211,202	336,397	874,804	3.6
26-27	194,896	75,700	44,789	47,679	1,389,329	429,399	959,930	3.2
27-28	217,304	86,593	54,595	53,353	1,585,277	541,057	1,044,221	2.9
28-29	242,343	98,562	66,071	59,713	1,800,398	674,573	1,125,825	2.7
29-30	270,323	111,689	79,491	66,842	2,036,078	833,668	1,202,410	2.4
30-31	301,602	126,170	91,280	74,836	2,297,734	1,013,383	1,284,351	2.3
31-32	336,528	142,246	104,515	83,786	2,588,207	1,216,215	1,371,992	2.1
32-33	375,553	160,092	119,374	93,815	2,910,663	1,444,928	1,465,735	2.0
37-38	650,748	283,500	225,566	165,117	5,140,423	3,098,018	2,042,405	1.7
42-43	1,122,852	491,395	410,568	288,827	8,896,132	6,041,873	2,854,259	1.5
47-48	1,912,762	840,199	726,230	497,723	15,192,929	11,178,172	4,014,757	1.4

#### 4.1.4 Final remarks

Regardless the decision by WCF on the scenario of contribution rates, the information campaign to employers should make it clear that the rate change is part of an adjustment process and that contribution rates should be expected to regularly change in order to respond to the emerging experience and better respect the equity principles.

There are valid reasons to support both the ILO's scenario and WCF's first scenario for the contribution rates of years 2020-2021 to 2023-2024 when the next actuarial valuation is expected to be completed. The ILO recommends setting the contribution rate for the years 2020-2021 to 2023-2024 at 0.6 percent for the private sector and 0.5 percent for the public sector because data suggest that the private sector employers are exposed to slightly higher risks. The recommended contribution rate of that scenario could turn to be a better transition to risk-based pricing by industry.

However, ILO is not particularly for the second scenario proposed by WCF as there is no financial justification to raise the contribution rate for the public sector and this scenario would maintain a free reserve above the recommended level. In addition, projections show that a contribution rate decrease to 0.5 percent for the public sector could be justified by findings of the next actuarial valuation if the current assumptions or more favorable ones are realized. The Government (as an employer) and possibly other stakeholders could question the reasonableness of the decision regarding a rate increase to 0.6 percent for the public sector. While rate setting is a political decision and there is no obligation to respect findings of actuarial analysis, governors may face a loss of credibility when their decisions are not consistent with actuarial findings and the reality does not prove they were right to do so.

## 4.2 PENSION INDEXING

The law provides that pensions may be revalued by decision of the Minister after recommendation of the Board of Directors. ILO conventions recommend increasing periodic payments in order to maintain the purchasing power of the benefit. ILO generally recommends that an automatic pension revaluation mechanism be put in place. Ideally, this mechanism should be enshrined in law.

One of the reasons given for an indexation mechanism subject to decision by the Regulator rather than an automatic one is prudence in financial management. It would be easier to take into account the capacity of funds to increase benefits when there is some room for decision making. However, the ILO believes that it is possible to put in place automatic mechanisms for indexation of benefits without jeopardizing the sustainability of the scheme by putting in place some safeguards. Since it would be impractical to wait for a legislative change protect the purchasing power of current pensioners, the recommendations of this evaluation fit into the current legislative context.

The results of this actuarial valuation indicate that the financial health of the plan is sound and that therefore there is no problem in making an increase of pensions in order to protect their purchasing power as at 1 July 2019. As it will be a few years before another actuarial valuation is done, the proposal consists of a formula that would be applied each year so as to avoid a long delay before the next increase.

In establishing an indexation formula, choices must be made about the indicator used to increase the pensions and the timing of indexing.

The Consumer price index (CPI) is generally considered an appropriate measure to reflect the variation in purchasing power. Schemes promoting participation of pensioners in the increase of productivity use a combination of price and wage indicators. The ILO recommends the usage of the CPI in order to contain costs while adequately protecting the workers. In principle, if the objective is to protect against loss of purchasing power, price increases should be provided according to forecasts of CPI variations. However, this is not a desirable approach because of the risk of errors and the general practice is to use past statistics. In the long term, the protection of the purchasing power is adequate though there may be apparent timings mismatches when inflation fluctuates significantly.

Since it takes a while for the CPI data to be available for a given period, this must be taken account when choosing the periods used to determine the pension indexing percentage. In the case of

Tanzania, it appears that CPI monthly data are available quickly. To measure inflation, one must also consider whether to use the variation in the CPI at a specific of the year or the variation of an average of twelve-month indices over that of the previous twelve months. The ILO recommends the latter approach because it gives smoother results.

With regard to the timing of pension indexation, one of the best approaches is to use the anniversary date of the incident giving right to compensation. This technique requires a relatively complex claims management system and is not applicable in all cases. The generally used approach is to apply indexing at a specific date, which is usually at the beginning of a fiscal year as this is much simpler from an administrative point of view. This approach, however, raises an equity issue if the same factor is applied to all pensions irrespective of the date of the incident in the year. Equity would suggest that the variation in the pension be proportional to the time elapsed since the accident. Thus, the person who had an accident at the beginning of the year would be entitled to full indexation while the person who had it at the last day of the year would not be entitled to any indexation. A rigorous application of the concept of equity generates administrative complexity in this case as well. Inequity resulting from a simple approach by applying the same indexing factor irrespective of the date of accident is of limited magnitude and has no significant impact on financial health of the scheme. The ILO believes such simplicity is desirable in the current context.

The ILO proposal is as follows:

- Pensions are increased every first July by taking into account the change in the sum of the 12-month CPIs ending in March on the sum of the 12-month CPIs ending in March of the previous year.
- For cases where the occurrence of the event (accident or illness) occurred in the 2016-2017 fiscal year, it is necessary to provide for 3 years of indexation, i.e., those for 1 July 2017, 2018 and 2019, for those whose the occurrence is in the 2017-2018 fiscal year, there must be two and only one for those whose occurrence is in the 2018-2019 fiscal year.

Pensions that begin to be paid after the year of occurrence of the event that creates a right to benefit entitlement, for example a disability pension beginning in the 2018-2019 fiscal year related to an accident occurring in 2017-2018, should be indexed as soon as the first payment as if the pension had started in 2017-2018.

Table 4.8 shows the recommended pension increase percentages as of 1 July 2019 and the underlying calculation. The same formula should be applied to update the maximum and minimum pensions as well as the funeral benefits.

**Table 4.8 Pension indexing on 1 July 2019**

Calculation of indexing percentages		
Period	Average CPI	Variation of average CPI
April 2015 to March 2016	99.29	
April 2016 to March 2017	104.38	5.13%
April 2017 to March 2018	109.49	4.89%
April 2018 to March 2019	113.07	3.27%
Indexation on 1 July 2019 or at the first payment of pension if later		
Year of incident	Percentage	
2016-2017	13.88%	
2017-2018	8.32%	
2018-2019	3.27%	

On subsequent 1 July in 2020, 2021 and so on, the same formula would be used to determine the indexing percentages. It is understood that, at this stage, WCF may be in a difficult situation to implement this recommendation on 1 July 2019 because of the publication of the methodology and rates to be made by the Government. However, if the stakeholders were to retain this solution for an implementation on 1 July 2020, the table would remain the same, with the addition of the indexation to be made for the financial year 2019-2020.

## 4.3 BENEFITS LIABILITY IN FINANCIAL STATEMENTS

Benefits liability currently reported in Statement of the Financial Position and the benefits expenses reported in the financial statements do not consider the value of permanent disability and survivors' pensions related to incidents that have occurred up to the end of the financial years beyond the end of the financial year. The intention of Note 3.5 "*Claims incurred comprise the total estimated cost of claims that have occurred in the year and for which the Fund is responsible, whether or not reported by the end of the year*" seems to recognize the full cost of claims. This implies to include the present value of future pension payments in the liabilities. This calculation is made in two steps.

- One of them consists in determining the present value of pensions in payment at the end of the year.
- The other one consists in determining the present value of pensions that will start to be paid after the end of the financial year, usually based on historical claims development patterns.

These calculations are the responsibility of the actuary. There are different techniques to obtain the results and ILO will be happy to support the WCF in its search to establish the most appropriate way. One way that the ILO could support to WCF is by providing detailed tables representing the present value of pensions by type of pensions, age and sex. Table 4.9 provides an illustration of the present value of pensions based on the assumptions used in the base scenario of this valuation.

**Table 4.9 Illustration of the present value of a monthly pension of 1**

Age	Disability		Adult survivors	
	Male	Female	Male	Female
25	457.2	484.2	501.1	521.2
35	400.6	423.1	429.0	448.1
45	336.3	356.9	351.2	369.8
55	268.4	286.1	271.2	288.4
65	192.0	205.6	192.0	205.6
75	120.1	129.2	120.1	129.2

As the determination of the present value of pensions considers the time value of money, the sentence "*The Fund does not discount its liabilities for unpaid claims.*" would have to be adjusted accordingly. For short-term liabilities, not discounting liabilities is a practical approach that does not distort much the reality, but it would not be acceptable in the determination of long-term liabilities.

## 4.4 MINIMUM AND MAXIMUM PENSIONS

Certain provisions of the Regulation concerning the application of minimum and maximum pensions do not seem to respect the principles of equity generally underlying these measures with regards to invalidity benefits. For pensions to the survivors of deceased persons, no appearance of inconsistency has been identified.

Concerns are raised with temporary and long-term disability pensions with a degree of disability less than 100 percent.

- The pension is compared to the stated maximum pension with no adjustment for the degree of disability, and
- The minimum pension is not applicable.

The inequity results from the fact that (1) a person with a very high salary and a small degree of disability could receive a pension equal to that of a person with a degree of disability of 100 percent and a low salary and (2) workers with a small degree of disability and low salary would receive a pension that does not provide the same degree of protection as that of workers with 100 percent degree of disability. To improve equity, the maximum pension should be adjusted with the degree of disability and the minimum pension should also be applied after adjustment for the degree of disability. A change to the current regulation would be necessary.

WCF should also consider an alternative way to define the maximum and the minimum pensions. It currently refers to the implementation of a ceiling on assessable earnings. The calculation of the pension would be done considering the maximum insurable earnings. There would be no longer any need to define a maximum pension that requires to be adjusted according to the degree of disability. As far as the minimum pension is concerned, the solution would be to define in the regulation a minimum wage for the purposes of compensation. The disadvantage of such a solution would be a reduction in the contribution income as earnings above the ceiling would not be subject to contribution anymore.

The ILO recommends that WCF initiate a change that would improve equity in the determination of minimum and maximum pensions and consider the opportunity to make it through the implementation of a ceiling on assessable earnings.

Impact of the proposed changes were studied in a two-fold manner in the actuarial projection. It reflects the proposed phase-in implementation that could be contemplated by WCF:

1. Application of the minimum pension in line with ILO's proposal stated above; and
2. Application of the concept of the maximum insurable earnings instead of maximum pension (2-fold effect: reduction of contribution assessment basis and uniform application of the maximum benefit amount in line with the ILO's proposal)

The application of the minimum in line with ILO's proposal has a slight effect on the financial situation of the scheme. The increase in benefit payment, with no change to the insurance earnings, leads to an increase of the benefit from 0.43 to 0.45 per cent of insurable earnings at the end of the projection period.

The application of the concept of maximum insurable earnings has also a small effect on the cost of the benefit expressed as a percentage of the insurable earnings. This is mainly due to the fact that the amount of insurable earning is reduced for all the amount that are above the equivalent insurable earnings compared to the current maximum pension payable. The cost of the benefits expressed as percentage of insurable earnings increases from 0.43 to 0.48 per cent.

WCF mentioned to the ILO that the implementation of these proposals could be done in a gradual way, and in line with other internal planned activities. For example, the application of the minimum could be made at the same time that WCF will start to assess the application of the minimum wages of worker by sector.

Table 4.10 shows results for both scenario for selected years.

Table 4.10 Key results of proposed application of minimums and maximums

Year	Base scenario			ILO's proposal of the application of the minimum			ILO'S proposal of the application of the minimum and maximum insurable earnings concept		
	Insurable earnings <sup>1</sup>	Total cost of benefits <sup>1</sup>	Benefits as % of insurable earnings	Insurable earnings <sup>1</sup>	Total cost of benefits <sup>1</sup>	Benefits as % of insurable earnings	Insurable earnings <sup>1</sup>	Total cost of benefits <sup>1</sup>	Benefits as % of insurable earnings
<b>18-19</b>	14,000,808	20,206	0.14	14,000,808	21,038	0.15	13,962,847	21,158	0.15
<b>22-23</b>	21,064,586	53,031	0.25	21,064,586	56,229	0.27	21,034,362	56,720	0.27
<b>27-28</b>	36,217,340	137,400	0.38	36,217,340	146,907	0.41	36,164,538	148,640	0.41
<b>32-33</b>	62,592,189	269,543	0.43	62,592,189	288,957	0.46	62,500,583	293,505	0.47
<b>37-38</b>	108,458,068	467,207	0.43	108,458,068	499,861	0.46	108,296,926	511,916	0.47
<b>42-43</b>	187,141,975	805,203	0.43	187,141,975	854,758	0.46	186,832,959	888,356	0.48
<b>47-48</b>	318,793,607	1,367,442	0.43	318,793,607	1,434,230	0.45	318,225,908	1,521,243	0.48

<sup>1</sup> In millions of TZS.

As shown in the previous table, the change to the paradigm of minimum and maximum insurable earnings has an impact on the contribution required at the end of the projection period. The usage of maximum earnings has a two-fold effect of increasing the level of benefits paid (usage of wage index instead of inflation index) and limits the contribution assessment basis. However, in the short-term, it has a limited effect on the financial situation of the scheme.

Again, as with the recommendation with the indexation, it may be difficult to implement it in the short-term. WCF is still in the process of building a strong foundation as an organization, in which activities are planned for the next years. For example, there are some plans related to the verification/enforcement of the minimum wages by sector for the insured workers. It could be useful and efficient to consider the implementation of this recommendation with the other planned activities of WCF that have a clear linkage with it.

## 4.5 INVESTMENT POLICY

The comments in this section relate to the investment policy that the Investment and Finance Committee recommended to the Board for approval in the 2017-2018 fiscal year.

The investment policy covers all the elements that are generally found in this type of document. Its analysis revealed no flaws although we still have some comments to bring to the Board's attention.

The term "surplus" is used to refer to the assets to which the investment policy applies. This term seems a little vague and likely to be confusing. The fund aims to ensure the security of benefits payable over long periods of time and must as such invest the assets corresponding to those liabilities and not only the excess of assets over the liabilities as the use of the word surplus may be interpreted. It would be more accurate if the policy refers to assets that the fund does not need in the short term and that serve to secure the benefits liabilities.

Among the concepts to consider in investment strategies, we find in section 2.4 this one:

### ***b) Matching of Assets and Liabilities***

*The Fund will use matching principle to match its assets and liabilities. This strategy aims at making sure that the investment assets are invested and be available for use to settle any liabilities (Fund's Obligation) when they fall due. This will be achieved by matching duration of assets and liabilities.*

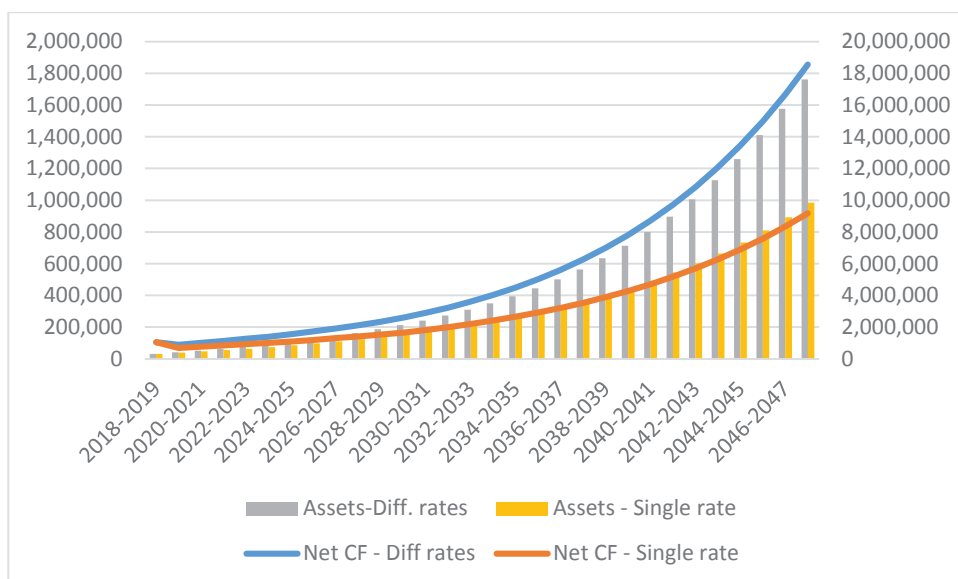
In public schemes that are in principle assumed to exist indefinitely, this criterion does not have the importance that it has in the context of private insurance plans where assets must at any time meet the obligations relating to benefits in the event of closure of the company. A public plan fund can afford to invest in types of investments and on horizons dictated by its approach of balancing risk and return without worrying about limitations related to assets-liabilities matching as long as net cash flows are such that the fund will not have to liquidate assets at inappropriate times. It is thus possible to aim for a better return than in a portfolio forced to perfect matching of assets and liabilities and to be exposed to yield fluctuations. However, risk-taking must be limited to avoid permanent losses or excessive annual fluctuations of yield that are difficult for stakeholders to accept. In the same vein, the following two remarks apply:

- The content of section 4.3 (d) which provides a balance between long-term and short-term investments based on benefits liabilities does not seem relevant in the context of a public scheme.
- The Head responsible for Actuarial Services and Risk Management should consider the elements discussed above in the execution of his duties as described in Section 5.3 g), in particular that of bullet 4: "Inform the directorate responsible for Investments on Fund's liabilities and advice on investment horizon to be undertaken by the Fund."

Figure 4.1 shows the projected net cash flows and accumulated assets for each of the contribution rate scenarios presented in section 4.1. The current valuation indicate that assets would grow steadily in the projection period.



Figure 4.1 Net cash flow and assets by contribution rate scenario



The benchmark of the real rate of return presented in Section 7.3.1 of the investment policy is of 1 per cent. The assumption used for this actuarial valuation is the same one as stated in the investment policy. The choice of this assumption assumes that the management of the fund will achieve a long-term yield that is equivalent to the benchmark.

## 4.6 ADEQUACY OF PERMANENT DISABILITY BENEFITS

### 4.6.1 Medical benefit

Under the Workers' Compensation Act of 2015, WCF has to provide benefits to permanently disabled worker following the diagnosis of a workplace accident (including commuting accident) and disease. As such, the Act provides for income replacement and medical benefits.

Related to the medical benefits, section 62.-(1) stipulates that “*The Director-General shall, for a period of not more than two years from the date of an accident or the contracting of an occupational disease pay the reasonable cost incurred by or on behalf of an employee in respect of medical aid necessitated by the accident or the disease.*” The ILO believes that this 2-year limitation is contrary to the *raison d'être* of an EII scheme, is not in line with the Conventions and suggests that this should be removed.

EII schemes are established to ensure proper compensation to injured worker for the whole duration of the disability or disease. The employer's liability related to the accident or disease is passed to the EII scheme, which then has to provide the adequate amount to cover for the cost related to the accident. For certain type of accident and disease, it is reasonable to assume that medical cost will be incurred by the injured worker for the rest of his/her life. For example, in an event where an injured worker must have a prosthetic limb following an accident, it must be assumed that the limb will have to be changed every number of years. Also, one could consider that the diagnosis of asbestosis might incur medical treatment for the rest of the life of the diseased worker. However, based on the current Act, the medical cost associated to these two cases would stop being reimbursed by WCF after a period of two years. In order to provide adequate compensation to the injured worker, the social partners in Tanzania should consider removing this limitation period. In order to contain the cost associated with these benefits that can be paid over a long period of time, WCF should instead issue guidance and recommendations on the appropriate medical assistance that should be provided over a long period of time to medically assist a disabled or diseased worker.

As the scheme is new, there is not a lot of experience on this matter that would allow to make for a clear financial impact on the proposed change. However, one thing that can be considered is that the present value of these medical costs in the future should not be very important. Not all medical cases will incur costs over the long-term. And for the cases where long-term payment are required, these cashflows will not amount for a significant part of all the present value of the medical benefits



to be paid. International experience shows that most of the cash flows related to the medical benefits are incurred in the first year following the accident. We do not believe that the experience will be much different for WCF in Tanzania.

#### 4.6.2 Compensation of permanent impairment

The current compensation for permanent impairment in place at WCF is based on overall compensation for the occupational and physiological damages sustained by a work-related accident victim. This benefit is paid as a lifetime annuity. The benefit is calculated based on the degree of disability stated as per the guidelines published by WCF and assessed by medical practitioner in Tanzania. The amount of the pension is purely based on the medical condition of the victim, without any consideration to the earning capacity following the work-related accident.

Another approach to compensation of permanent impairment is to analyse and compensate based on the loss of earning capacity and non-pecuniary damage. The loss of earning capacity takes into account the ability of the injured worker to return to any kind of work and to compensate for any loss of earning ability. Under this approach, an injured worker that is victim of a very small disablement that does not prevent him/her to return to his/her former work may only be entitled to the non-pecuniary damage compensation (usually a lump sum, but can also be provided as a lifetime annuity) and no loss of earning capacity pension.

In recent decades, the trend in European countries has been to move gradually from the system of overall compensation to a system of separate compensation for damage, with Switzerland changing in 1984, Italy in 2000 and Luxemburg in 2010<sup>15</sup>. These changes lead to a more personalised compensation and an individualisation of the compensation system. However, both systems have their advantages and disadvantages. Even if the compensation amount would differ from one system to the other, it is not certain that the permanent impairment compensation would necessarily increase in all cases. Some cases would see a lower benefit amount while other could see a higher benefit amount. The main important difference would be the methodology of the calculation and the approach of the compensation of WCF.

This change could be contemplated in the long-term for WCF. As the scheme will get more mature and when industry-rating will be implemented, discussion with social partners in Tanzania could be done around the appropriate compensation system that should be used to deliver permanent impairment benefit to disabled and sick workers. One way of preparing these discussions and to analyse the necessity to make the change would be to ensure proper follow-up on current disability cases. WCF could ensure a mandatory follow-up with disabled victims of workplace accident 3 years after the beginning of the payment of the pension or the lump-sum. During the follow-up, WCF could verify that the disability compensation was insufficient, sufficient or over sufficient to cover for the losses of the injured worker. Based on the observations of these mandatory follow-up, social partners in Tanzania would be in a better position to assess if a change should be formally contemplated or not.

### 4.7 DATA MANAGEMENT

In order to perform the actuarial valuation, extensive data was required by the actuarial model. A formal data request was sent by the ILO to WCF. The required information was first transmitted to the ILO on the basis of the request. As the actuaries analysed the data, additional information was requested by the ILO and WCF was able to communicate the additional data in timely manner. However, some manual work was required on WCF side.

Also, WCF has a mid-term plan to implement industry rating contribution setting and, following this implementation, experience-based rating system in the long-term. WCF is seeking guidance on this subject and the ILO believes that one key aspect of implementing this system is related to the data management.

First, it is recommended that the data management system is adjusted to systematically refer to the industry. This reference to the industry needs to be systematic for the classification of covered worker, and also needs to be implemented in the claims data. The systematic reference will allow

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<sup>15</sup> [Compensation of permanent impairment resulting from occupational injuries in Europe](#), December 2010, EUROGIP/European Forum

for a thorough actuarial calculation for the next actuarial valuation, as to develop a solid contribution base and detailed claims projection by industry. As more experience will have emerge and the data system will be robust, this rate-setting activity will be carried out with more confidence and WCF will be able to draft a possible roadmap on the implementation of industry-rate setting.

Also, one addition to be made to the claims data in place should be to add the nature of the death of the insured worker. As of now, deaths are classified as one event, without regards to the nature of the incident (accident, disease or commuting). However, after additional data request and work from WCF, it was found out that the death claims may be different by the nature of the incident. Further refinement of this assumption would be possible in the future based on the emerging experience of the scheme.

It is important to remember that the current industry categories used by WCF may combine different risk profile within the same industry. One good example of the mixing of risk profile is the industry called “*Construction*”. Within that single groups, one could find engineers and rooftop workers for example. It is evident that the risk profile of these two workers, within the same industry, is quite different and may justify the usage of a different contribution rate.

At this stage, it is too premature to reflect on possible change to the industry system used by WCF. The ILO proposes to keep the current industry rating in place and to gather more data based on the experience of the scheme in the next years. For the next actuarial valuation, analysis of the industry experience will allow formal proposition to further refine the category used by WCF. It is important to remember that a precise rating system could involve numerous categories. Some systems use up to 100 different type of industry and sub-categories to establish their rating system. Stakeholders will have to discuss on a potential and implementable system in Tanzania that reflects the reality on the ground.

Hence, the proposed work-plan of the ILO is as such:

1. Systematically implement the industry code in the insured worker databases and in the claims database;
2. During the next actuarial valuation, perform calculation of industry-rating based on the gathered data following the proposed modification of the database; and
3. ILO will recommend a way-forward regarding the classification of the industry-rating and a gradual work-plan regarding the industry-rating contribution basis.

## ACTUARIAL OPINION

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In our opinion:

- Globally, the data collection process at the Workers Compensation Fund is appropriate and reliable. However, the scheme is new, so limited experience has emerged. Hence, appropriate methods were used to fill the gaps in data (e.g. smoothing techniques and usage of proxy data). These methods are described in Appendix 4 of this report;
- The assumptions used for the report are reasonable and appropriate both in the aggregate and individually, even if they do rely on limited data of the experience of scheme. It is expected that the assumptions will be based on more robust data in future actuarial valuations as more experience will emerge from the scheme;
- The methodology employed is appropriate and consistent with accepted actuarial practice; and
- WCF is financially sustainable over the projection period if the current contribution rates are maintained or the recommended changes are applied.

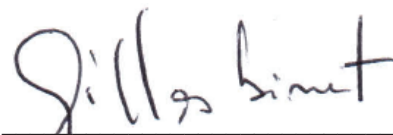
The report and the opinions given have been prepared in accordance with the accepted actuarial practice as provided by the *International Standards of Actuarial Practice 2: Financial Analysis of Social Security Programs* of the *International Actuarial Association* to the extent they are applicable to employment injury protection schemes



**Raphaël Imbeault, FSA, FCIA**

Senior Actuary, ILO

Global Employment Injury Programme Unit



**Gilles Binet, FSA, FCIA**

ILO External Collaborator,

Senior Actuary

**30 July 2019**

## A1 APPENDIX 1: SUMMARY OF BENEFIT PROVISIONS

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This appendix provides a general overview of the key coverage, contribution and benefit provisions of the WCF Scheme as at 30 June 2018. This summary takes into account the latest amendments that were adopted and draft amendments that were proposed to the Government.

In the lines below, the Act and Regulations below are explicitly referred to:

- The Workers' Compensation Act [Principal Legislation] – Revised Edition of 2015 [A.]
- The Workers' Compensation Regulations, 2016, Arrangement of Regulations [R.]
- The Workers' Compensation (Payment of Tariff) Regulations, 2016 [R. Tar.16]
- The Workers' Compensation (Payment of Tariff) Regulations, 2017 [R. Tar.17]
- The Written Laws (Miscellaneous Amendments) (No. 4) Act, 2017 – Part VI – Amendment of the Workers' Compensation Fund Act [R. Amend. 2017]

### A1.1 ADMINISTERING ORGANIZATION

The Workers' Compensation Fund is established to administer the Scheme [A. 5(1)]. A Tripartite Board of Trustees is established to administer the Fund [A. 12(1)]. The Board members shall hold office for a period of three years and may be eligible for a re-appointment for one more term [A. First Schedule 2]. The Board shall be composed of [A. First Schedule 1 & R. Amend. 2017 (36)]:

- A Chairman (named by the President);
- Two members representing the most representative employers' organization;
- Two members representing the most representative employee's organization;
- A law officer representing the Attorney General;
- A representative from the Ministry responsible for social security;
- A representative from the Ministry responsible for Public Service Management;
- A representative from the Ministry responsible for finance; and
- A representative from an association of persons with disabilities arising from related injuries or diseases.

### A1.2 CONTRIBUTIONS TO THE SCHEME

Assessment must be paid by the Employers to the Scheme [A. 74(1)]. Assessment can take into account industry rating and/or experience rating [A. 74(3)]. Contributions paid for by Employers must provide for the capitalized value of the pensions [A. 74(4)]. Earnings can be capped up to a certain level via Regulations as for the establishment of the assessment [A. 74(7)]. No such cap is in place as at valuation date.

The Employer's current contribution rate is establish as follow:

- 0.5 per cent of annual earnings of an employee of the public sector [R. Tar.16 5(1) & R. Tar.17 5(1)]
- 1.0 per cent of annual earnings of an employee of the private sector [R. Tar.16 5(2) & R. Tar.17 5(2)]

An Employer cannot deduct from the earnings of an employee or receive any amount from the employee to compensate the employer directly or indirectly for any amount which the employer is liable to pay under the Workers' Compensation Act [A. 60(1)].

### A1.3 CATEGORIES OF EMPLOYEES COVERED

Where an employee has an accident resulting in the employee's disablement or death, the employee or his/her dependents are entitled to the compensation as provided under the Act [A. 19(1)].

An employee is defined as any person, including an apprentice, but excluding an independent contractor, who works for another person or for the state and who receives, or is entitled to receive, any remuneration [A. 4].

## A1.4 RIGHT TO COMPENSATION AND PROTECTION

Compensation should be provided under the Act for disability and disease resulting from:

- Occupational injury [A. 19];
- Accidents during conveyance by employer [A. 20];
- Accidents during training for or performance of emergency services [A. 21];
- Occupational diseases as set out in the Third Schedule of the Act [A. 22]; and
- Accidents or diseases contracted outside Tanzania for an employee that have been outside Tanzania for less than 12 months and still working for a Tanzanian employer [A. 24].

## A1.5 DEFINITION OF EARNINGS

In order to determine compensation, the Fund shall calculate the earnings of an employee in the monthly rate at which the employee was being remunerated at the time before the accident [A. 58(1)]. Earnings shall include [A. 58(2)(a)]:

- The value of food or quarters or both supplied by the employer; and
- Any overtime payment or other special remuneration in cash or in kind of a regular nature or for work ordinarily performed.

Earnings shall exclude [A. 58(2)(b)]:

- Payment for intermittent overtime;
- Payment for non-recurrent occasional services;
- Amounts paid by an employer to an employee to cover any special expenses; and
- *Ex gratia* payments whether by the employer or any other person.

## A1.6 COMPENSATION PROVIDED UNDER THE ACT

### ***Temporary total or partial disability***

Compensation for temporary total disablement shall be calculated on the basis of 70 per cent of the employee's monthly earnings at the time of the accident [A. 46(1)]. Compensation for temporary partial disablement shall consist of the portion of the amount calculated for temporary total disablement, as per the degree of disablement [A. 46(2)].

If a temporary total or partial disablement lasts for three days or less, no compensation shall be paid by the Fund [R. 37(1)].

The first compensation should be provided directly by the Employer [A. 46(3)], which should be reimbursed by the Fund subsequently [A. 46(4)]. Periodical payments shall take place for as long as the temporary disablement continues, but for no more than 24 months [A. 46(8)].

Compensation amount for temporary total disablement shall be no less than TZS275,702.83 per month and no more than TZS3,685,852.69 per month. [R. 36(2)]. For temporary partial disablement, the compensation amount should not be more than TZS3,685,852.69 per month [R. 36(3)].

### ***Permanent disability***

Compensation for permanent disablement shall be calculated as 70 per cent of the monthly earnings at the time of the accident multiplied by the degree of permanent disability (up to 100 per cent) [A. 48(4)]. The monthly pension shall expire at the end of the month in which the employee dies [A. 48(6)].

Compensation for permanent disablement of 100 per cent shall be no less than TZS275,702.83 per month and no more than TZS3,685,852.69 per month [R. 38(2)]. For permanent disablement less than 100 per cent, the compensation amount should not be more than TZS3,685,852.69 per month [R. 38(2)].

Compensation shall lapse when the employee resumes work or qualifies for payment of an old age or invalidity pension upon reaching retirement age [R. Amend. 2017 35(b)].

### Survivors benefits (Widow/widower, orphans and parents)

The compensation provided to a surviving spouse or dependent (common-law spouse) as defined in the Act shall be [A. 52(1)(a)]:

- A lump sum based on twice the monthly pension provided for permanent disability; or
- A monthly pension equal to 40 per cent of the pension for permanent disability.

For an orphan under the age of 18 years, a monthly pension is provided and shall be equal to 20 per cent of the pension for permanent disability [A. 52(1)(b)]. If a surviving spouse dies while an orphan is still entitled to the compensation, the monthly pension amount paid to the orphan can be increased up to 40 per cent of the pension for permanent disability [A. 52(1)(c)]. Benefits provided to an orphan shall lapse at the attainment of age 18, unless [A 52(4)]:

- An orphan that is considered physically or mentally disabled;
- He/she is still completing secondary education; or
- He/she is completing higher education where it could reasonably have been expected the deceased employee would have contributed to the maintenance of the child.

If the employee does not leave any spouse or orphan, a parent, brother, sister, half-brother, half-sister, grand-parent or grand child may receive a monthly pension not exceeding 40 per cent of the amount provided for permanent disability if he/she is fully dependent [A. 52(1)(d)(i)]. If this person is not fully dependent, a lump sum will be provided based on the level of dependence as determined by the Fund [A. 52(1)(d)(ii)]. If one or more dependents are entitled to the above benefit, the total amount of benefit paid to each dependent shall not be more than what would be provided under the circumstance of one dependent [A 52(2)(a)].

**Table A1.1 Summary of survivor's benefits payable according to different family profile**

Scenario	Example 1	Example 2	Example 3
Number of widow(er)	1	1	0
Number of orphan(s)	2	4	0
Number of other dependents <sup>1</sup>	N/A	N/A	2
Pension to widow(er) <sup>2</sup>	40	40	N/A
Pension to orphan(s) <sup>2</sup>	40	60	N/A
Pension to dependents <sup>12</sup>	N/A	N/A	40

<sup>1</sup> In this table, it is assumed that the other dependents were wholly financially dependent upon the deceased employee

<sup>2</sup> Expressed as a percentage of the permanent disability pension the deceased employee would have been entitled to (70 per cent of the monthly earnings at the time of the accident)

The compensation provided to a surviving spouse or any dependent shall be no less than TZS111,281.13 per month and no more than TZS1,474,341.08 per month [R. 41(1)(a)(ii) & R. 41(1)(c)(i)]. In case of a lump sum payment, the amount provided shall be no less than TZS551,405.66 and TZS7,371,705.38 [R. 41(1)(a)(i)]. The compensation provided to an orphan shall be no less than TZS55,140.57 per month and no more than TZS737,170.54 per month [R. 41(1)(b)(i)].

### Funeral benefit

A funeral benefit shall be provided by the Fund that is equal to an amount set by the Director-General that is deem suitable [R. 40(1)].

### Occupational diseases benefit

The amount of benefit provided by the Fund shall be calculated in a similar way to the permanent disablement benefit [A. 59].



### ***Occupational diseases benefit***

The amount of benefit provided by the Fund shall be calculated in a similar way to the permanent disablement benefit [A. 59].

### ***Medical aid and rehabilitation benefits***

Medical benefits paid for by the Fund shall include:

- Conveyance to a hospital or medical practitioner [A. 61(1)]; and
- Cost related to medical aid necessitated by the accident or disease, for a period less than 24 months from the date of the accident [A. 62(1)].

After two years of medical aid, the Director-General may consider the employee to have permanent disablement [A. 62(3)].

Medical tariff shall be determined by the Director-General [A. 65(1)].

Regarding rehabilitation services, the Fund shall provide [A. 69(2)]:

- Clinical rehabilitation for the purpose of physical and psychological recovery;
- Vocational rehabilitation to assist an employee to maintain employment or regain or acquire vocational independence; and
- Social rehabilitation to assist in restoring an employee's independence to the maximum extent practicable.

## **A1.7 PAYMENT OF LUMP SUM IN LIEU OF MONTHLY PENSION**

Compensation for permanent disablement for employee with a degree of disablement that is 30 per cent or less shall be provided in lump sum in lieu of monthly pension. The lump sum shall be calculated multiplying the monthly earnings by 84, by 70 per cent and by the degree of disablement [R. Amend. 2017 35(a)].

## **A1.8 INCREASE OF MONTHLY PENSION**

The Minister may, on the recommendation of the Board and by notice in the Gazette, increase the monthly pensions payable by such percentage as he may determine [A. 54(1)].

## **A1.9 FREQUENCY OF ACTUARIAL VALUATION**

The Fund shall, from time to time, as the Board may consider necessary, but in any event at intervals of not more than three years, be valued by an actuary appointed by the Board to determine the sufficiency of the Fund [A. 86(1)].

## A2 APPENDIX 2: SELF-ASSESSMENT TOOL ON COMPLIANCE WITH CONVENTION NO 121

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This appendix provides the results of the legal and framework analysis made under the self-assessment tool on compliance with Convention No 121 of the ILO.

In general, it can be said that the scheme administered by WCF is mostly in line with the provisions of Convention No 121. Changes required for the scheme to be in compliance with Convention No 121 are minor and would not dramatically impact the operation and the financing of the scheme. Tanzania could be a good candidate to ratify Convention No 121.

It is important to remember that the opinion and analysis expressed in this report, and more specifically this appendix, does not reflect the opinion of the *Committee of Experts on the Application of Conventions and Recommendations* and the *International Labour Standards Department (NORMES)*. If the Government is interested to ratify Convention No 121, a formal and complete legal review of the applicable legislation of occupation injury and disease compensation will be performed by the ILO and the conclusion reached may differ from the findings stated in this appendix.



Assessment Tool on the Fundamental Elements of an EII Scheme Based on Technical Guidelines and ILO Standards (Convention No. 121 inter alia)				
Subtopic	Technical Guideline or ILO Standard	Reference	National Framework	Assessment

The United Republic of Tanzania has ratified the following Conventions:

- [C012 - Workmen's Compensation \(Agriculture\) Convention, 1921 \(No. 12\)](#)
- [C017 - Workmen's Compensation \(Accidents\) Convention, 1925 \(No. 17\)](#)
- [C019 - Equality of Treatment \(Accident Compensation\) Convention, 1925 \(No. 19\)](#)

To carry out this assessment, the following act and regulation have been analysed:

- [The Workers' Compensation Act, Chapter 263.](#)
- [The Workers' Compensation Regulations, 2016](#)
- The Workers' Compensation (Payment of Tariff) Regulations, 2016
- The Workers' Compensation (Payment of Tariff) Regulations, 2017
- The Written Laws (Miscellaneous Amendments) (No. 4) Act, 2017

1. Coverage and Entitlement				
Workers covered	All public and private sector employees, including members of cooperatives and apprentices (subject to specific exceptions listed).	Convention No. 121, Art. 4	All employers and employees working in Mainland Tanzania, including manual and casual workers (WCA, art. 2).	National legislation seems to be in compliance with international standards. It notably includes the employees in the public sector, those employed in any capacity on a Tanzanian ship or aircraft and those employed outside Tanzania on any other ship or aircraft.
Definition of dependants	Dependants include spouses, children and parents.	Convention No. 121, Art. 1 (e) and practice	The following person who, at the time of the employee's death, was wholly or partly financially dependant upon the employee: (a) a spouse married to the employee; (b) a common law spouse; (c) An orphan under the age of 18 years old of the employee or of his spouse; (d) an orphan over 18 years old of the employee or of his spouse and any parent or person considered by the Director-General acting as a family responsible (WCA, art. 4).	National legislation seems to respond to international standards related to identification of the dependants.
Contingencies covered	Where due to an employment injury: • Any condition requiring medical or allied care; • Temporary incapacity for work; • Permanent partial or total disability (loss of faculty); • Sicknesses and diseases; • Breadwinner's death.	Convention No. 121, Art. 6	Contingencies covered are: - any condition requiring medical aid (WCA, art. 4 (definition of (accident) and (medical aid) et seq); - temporary total or partial disablement (WCA, art. 46 et seq); - permanent disablement (loss of faculty) (WCA, art. 48 et seq); - sicknesses and diseases (WCA, art. 22 (1), 23, 24); - breadwinner's death (WCA, art. 19 (3)B and 52).	The national act seems to be in compliance with requirements of the Conventions.

Subtopic	Technical Guideline or ILO Standard	Reference	National Framework	Assessment
Temporal coverage	No qualifying period. Workers have the right to receive the benefits throughout the contingency. Period of exposure may be prescribed for occupational diseases.	Convention No. 121, Art. 9	No qualifying period	The act does seem to be in line with international standards.
Entitlement to receive compensation	Injured workers are entitled to receive compensation even in cases where employers do not respect their obligations.	Convention No. 121, Art. 25	The employees who suffer an occupational injuries or contract an occupational disease at the workplace and in the case of death resulting from work injury are entitled to receive compensation (WCA, art. 3)A).	National legislation seems to respond to international standards related to entitlement to receive compensation.

2. Benefits and Rates				
Benefits' general objective	Benefits' general objective aims at improving the health of the injured persons and their ability to attend to their needs (medical care and allied services) and appropriately cover their loss of earnings (permanent disability and death).	Convention No. 121, art. 10 (2)	The objectives of this act are: - provide for adequate and equitable compensation and rehabilitation in order to restore health of employees who suffer occupational injuries or contract occupational diseases; - provide for a framework for the effective payment of a compensation benefits to the employees and their dependants; - provide for the establishment, control and administration of the workers compensation Fund. (WCA, art. 3).	The act's objectives seem to comply with international standards.
Medical care and allied benefits	Workers are entitled to medical care and allied benefits throughout the contingency. Medical care and allied benefits comprise: - general practitioner and specialist in-patient and out-patient care (including domiciliary visiting) ; - dental care; - nursing care at home or in hospital or other medical institutions; - maintenance in hospitals, convalescent homes, sanatoria or other medical institutions; - dental, pharmaceutical and other medical or surgical supplies (including prosthetic appliances kept in repair and renewed as necessary) and eyeglasses; - the care furnished by members of such other professions as may at any time be legally recognised as allied to the medical profession, under the supervision of a medical or dental practitioner; - all treatment at the workplace, such as emergency treatment of persons sustaining a serious accident and follow-up treatment of those whose injury is slight and does not entail discontinuance of work.	Convention No. 121, Art. 10 (1)	A reasonable cost is paid by the Director-General for employee's conveyance and medical aid for a period not exceeding 2 years (WCA, art. 61 and 62).	<b>Social Security [X]</b> <b>Employers' Liability [ ]</b> Further information is required as regards the extent and scope of the expression "reasonable cost" since international standards require that all related medical and allied care be covered. Also further information required as regards with the time limit if it is adequate as prescribed.

Subtopic	Technical Guideline or ILO Standard	Reference	National Framework	Assessment
Temporary incapacity and rate	Workers are entitled to receive cash benefits up to recovery or to the maximum payment period. The amount of the benefits is a percentage of the worker's average wage preceding the injury, but should not be lower than 60 %	Convention No. 102, Art. 36(2); Convention No. 121, Art. 14(3) and (5).	A periodic payments are paid as long as the temporary total incapacity continues, but this period may not exceed 24 months. (WCA, art. 46)8 and 9). <b>Benefits rate : 70% X monthly earnings</b> (WCA, art. 46).	<b>Social Security [X]</b> <b>Employers' Liability [ ]</b> National legislation seems in compliance with international standards.
Permanent disablement	Workers with permanent disability are entitled to receive periodic cash benefits for the rest of their life. Permanent disability benefits are paid at the same rate as temporary benefits (60%), and the amount of partial permanent disability benefits are reduced proportionately in line with the degree of disability.	Convention No. 102, Art. 36(2); Convention No. 121, Art. 14(3) and (5).	The employees with permanent disablement are entitled to receive a monthly pension until the end of the month in which the employee dies (WCA, art. 48 (4 and 6). Benefits rate: (70% X monthly earnings) X the degree of disablement)) (WCA, art. 48)4A and B).	<b>Social Security [X]</b> <b>Employers' Liability [ ]</b> Act seems in line with international standards. Further information required as regards the medical assessment and possible review
Survivors' benefits	Survivors' benefits are paid to dependants: - for spouse, survivors' benefits are paid for life (subject to conditions on a means test, if the case may be) or until remarriage; - for children, benefits are usually paid until they reach majority or working age. Survivors' benefits are calculated as a percentage of the worker's average wage for the months preceding the death. This rate depends on the structure of the family: the amount allowed to a widow or widower with two young children (standard beneficiary) should not be less than 50 % of the worker's average wage	Convention No. 102, Art. 1(d) and (e), 32(d), and 69(j); Convention No. 121, Art. 1(d) and (e), 6, 18 (1) and 22 (g). ILO Recommendation No. 121 foresees the case where survivors' benefits are paid to other dependants, such as parents who were mainly supported by the worker preceding his/her death: para. 13.	A pension payable to a spouse (by marriage or common law) of an employee shall lapse on the last day of the month in which the spouse dies (WCA, art. 52)6). Any pension payable to a child under the age of 18 years old lapses at the end of the month in which the child reaches the age of 18 years old, except if still dependant. Benefit rates are: (a) a spouse : (i) a lump sum equal to 2 X (70% * monthly earnings at the time of accident)) or (ii) a monthly pension equal to 40% X (70% * monthly earnings at the time of accident)) (b) for a child under/over the age of 18 years old, a monthly pension equal to 20% X (70% * monthly earnings at the time of accident)). Cannot exceed 70 % of employee's monthly earnings.	<b>Social Security [X]</b> <b>Employers' Liability [ ]</b> Further information required on: 1) the basis of calculation (what salary is considered); 2) calculation of the lump sum. Rate for a widow with 2 children seems to be 56%
Funeral benefit	A funeral benefit is provided to survivors to cover the expenses of an average funeral arrangement.	Convention No. 121, Art. 18 (2).	An amount of compensation is determined by the Minister for the funeral expenses of the employee who dies as a result of an injury caused by an accident (WCA, art. 53).	<b>Social Security [X]</b> <b>Employers' Liability [ ]</b> National legislation seems to be in compliance with international standards.
Periodic adjustment	Periodic payments must be periodically adjusted in order to maintain the purchasing power of the benefit (real benefit value against inflation).	Convention No. 102, Art. 65(10) and Art. 66(8); Convention No. 121, Art. 21 (1); Recommendation No. 121, para. 15.	On the recommendation of the Board and by notice in the Gazette, the Minister may increase the monthly pensions payable for a funeral and permanent disablement benefits by such percentage as he may determine (WCA, art. 54)1).	Further information as regards application of this provision. What about periodical adjustments for other benefit?

Subtopic	Technical Guideline or ILO Standard	Reference	National Framework	Assessment
<b>3. Health Care Components</b>				
Prescribed occupational diseases	A list revised in 2010 by the ILO for identification and recognition of occupational diseases may be incorporated to national legislation.	See <a href="https://www.ilo.org/safework/info/publications/WCMS_125137/lang-en/index.htm">https://www.ilo.org/safework/info/publications/WCMS_125137/lang-en/index.htm</a>	See Second Schedule for a list of diseases covered. Where an employee has sustained an injury not mentioned in the second schedule of this Act, the Director-General determines percentage of disablement in respect of the injury which leads to a result consistent with the Second Schedule (WCA, art. 48)2).	National legislation seems to be in compliance with international standards. However further information requested as regards how DG's authority is exercised.  Note: A National Guideline on Occupational Diseases is being drafted and will allow for more flexible changes to the list of diseases, standardization of diagnosis.
<b>4. Institution</b>				
Holistic approach	EII schemes encompass compensation, prevention at source (reducing risks and hazards in the workplace) and rehabilitation of injured workers.	Practice	The objectives of WCA, C. 263 ??? are inter alia to provide for: (a) adequate and equitable compensation for work related injury and diseases; (b) rehabilitation; (c) a framework for the effective, prompt and empathetic consideration, settlement and payment of a compensation benefits to the employees and their dependants; (d) the establishment, control and administration of the workers compensation Fund, (d) the prevention of the occupational accidents and diseases (WCA, art. 3). The Occupational Health and Safety Act, 2003 provides the general framework for OSH at work. The Occupational Safety and Health Authority (OSHA) is the authority in charge.	National legislation seems to be in compliance with international standards.
Administrative agency	EII scheme is under the responsibility of a professional institution (administrative agency with competent experts and staff) able to exercise substantial fiduciary responsibility.	Practice	The Workers Compensation Fund is established for the management of an EII scheme (WCA, art. 5)1).The Director-General is appointed by the President from 3 qualified persons of high integrity and who possess knowledge and experience in labour issues, insurance, social security or workers compensation matters recommended by the Minister (WCA, art. 6)1).	National legislation seems to be in compliance with international standards.
Supervision of the administrative agency	The administrative agency responsible for the EII structure is generally under the general supervision of a specific public institution (Ministry of Labour oftentimes).	Practice	The Board of Trustees of the Workers Compensation Fund supervises the fund and its management (WCA, art. 6)4), 12, 13 and 14).	National legislation seems to be in compliance with international standards.

Subtopic	Technical Guideline or ILO Standard	Reference	National Framework	Assessment
Tripartite governance and mandate	The administrative agency's board of directors is tripartite with members representing the government, the workers and the employers.	Convention No. 102, Art. 74 and Convention No. 121, Art. 24	<p>The membership of the Board is composed by:</p> <p>(a) Chairman who is appointed by the President; (b) other members appointed by the Minister as follows: (1) the Director-General who is the Secretary; (ii) the Labour Commissioner; (iii) a State Attorney from the Attorney' General-Office; (iv) a representative from Bank of Tanzania; (v) a member from OSH Authority; (vi) 3 members from the employers' association; (vii) 3 members from the Federation of Trade Unions; (viii) 2 members from association of persons with disability arising from a work injuries or disease; and (ix) 1 member from the Higher Learning Institution (WCA, First Schedule).</p> <p>The Board shall: a) collect all revenue due to the Fund; b) prevent irregular expenditure, fruitless and wasteful expenditure, losses resulting from criminal conduct, and expenditure not complying with the operational policies of the Fund; and c) establish, maintain and review system of administration of benefits and to monitor in a manner that ensures adequate and equitable compensation in accordance with the objects of the Act (WCA, art. 16(2)).</p>	National legislation related to Board's representativity and mandate seems to be adequate in the light of international standards.

5. Finance				
Contribution	The employers are the sole contributor to the scheme. Governments may fund part of the costs, notably to cover administrative expenses at the start of the programme or to cover the expenses of inspection services.	Practice	The amount of annual tariff to be paid by an employer is the sum of money equivalent to 0,5 % in the public sector (PM, art. 5 (1) and 1 % in the private sector (PM, art. 5 )2) of annual earnings of an employee.	National legislation seems to be in compliance with international standards.

Subtopic	Technical Guideline or ILO Standard	Reference	National Framework	Assessment
<b>6. Appeal</b>				
<b>Right of appeal</b>	<b>All claimants have a right of appeal in the case of refusal of the benefit or complaint as to its quality or quantity.</b>	<b>Convention No. 121, Art. 23 (1)</b>	<p>There are different ways of appeal:</p> <ul style="list-style-type: none"> <li>- The Director-General may review any decision connected with a claim for compensation or the award of compensation (WCA, art. 79)1);</li> <li>- Any person aggrieved by the decision of the Director-General may appeal against the decision within sixty working days to the Minister (WCA, art. 80)1).</li> </ul> <p>Once the above is exhausted, recourse to labour court possible (WCA, art. 80)2).</p>	National legislation seems to be in compliance with international standards.
<b>Equality of treatment</b>	<b>The member State within its territory assures to non-nationals equality of treatment with its own nationals as regards employment injury benefits.</b>	<b>Convention No. 121, Art. 27</b>	Employee's definition does not exclude or include explicitly non-nationals from its regime.	More information is required.

**LEGEND**

WCA The Workers' Compensation Act, Chapter 263.  
PM The Workers Compensation (Payment of Tariff) Regulations 2015

## A3 APPENDIX 3: METHODOLOGY OF THE ACTUARIAL VALUATION

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This actuarial review makes use of the comprehensive methodology developed at GEIP and other actuarial units of the ILO for reviewing the long-term actuarial and financial status of national social security systems. These modelling tools include a population model, an economic model, a labour force model, a wage model, a long-term benefits model, a short-term benefits model and an employment injury model. The review has been undertaken by constructing the macroeconomic framework model with the collaboration of the Actuarial Service Unit of the ILO for the most recent PSSSF actuarial valuation and by building a new benefit projection model from the ground up to reflect the benefit provisions of WCF.

The actuarial valuation starts with a projection of the future demographic and economic environment of Tanzania Mainland. Next, projection factors specifically related to the WCF are determined and used in combination with the demographic/economic framework.

For the current valuation, the model first projects the number of expected incidences by type and by year (accident, disease and commuting). After that, these injured workers are exposed to probability of having different type of claims: medical benefit, short-term disability, long-term disability and death benefits (funeral benefits, widow(er)'s pension, orphans' pension and parents' pension). It is important to note that these benefits are not mutually exclusive, i.e. a single injured worker may be entitled to more than one type of benefit as part of the actuarial projection. This model is in line with the way WCF is legally structured and administered. The selection of assumptions and the usage of data is explained in detail in Appendix 4 and is in line with the way the model works.

### A3.1 MODELLING THE DEMOGRAPHIC AND ECONOMIC ENVIRONMENT

The use of the ILO actuarial projection model requires the development of demographic and economic assumptions related to the general population, the economic growth, the labour market and the increase and distribution of wages. Other economic assumptions relate to the future rate of return on investments, the indexation of benefits and the adjustment of parameters like the future level of flat-rate benefits.

The selection of projection assumptions takes into account the recent experience of WCF to the extent this information was available.

#### *General population*

General population is projected starting with most current data on the general population, and applying appropriate mortality, fertility and migration assumptions.

#### *Economic growth*

Increase of the GDP growth, wage share of GDP and inflation rates are exogenous inputs to the economic model. The long-term productivity of labour assumption is the result of assumptions on the future evolution of the labour force, wage share of GDP and GDP growth.

#### *Labour force, employment and insured population*

The projection of the labour force, i.e. the number of persons available for work, is obtained by applying assumed labour force participation rates to the projected number of persons in the general population. Unemployment rates are assumed for the future and employment is calculated as the difference between labour force and unemployment.

## **Wages**

Based on an allocation of total GDP to capital income and to labour income, a starting average wage is calculated by dividing the wage share of GDP by the total number of employed persons.

In the medium term, real wage development is checked against the labour productivity growth. In specific labour market situations, wages might grow at a pace faster or slower than productivity. However, due to the long-term perspective of the present review, the real wage increase is assumed to gradually converge with real labour productivity. It is expected that wages will adjust to efficiency levels over time.

Wage distribution assumptions are also needed to simulate the possible impact of the social protection system on the distribution of income, for example through minimum and maximum pension provisions. Assumptions on the differentiation of wages by age and sex are established, as well as assumptions on the dispersion of wages between income groups.

## **A3.2 MODELLING THE FINANCIAL DEVELOPMENT OF WCF**

The present actuarial review addresses all revenue and expenditure items of WCF. Income and expenditures under the Employment injury scheme are projected separately using a model specifically developed by the ILO for the branch. Chart A3.1 presents the flow of financial balance projection. The most important components of this budget concern long-term benefits. All benefits are projected separately for each sex and age. Chart A3.2 summarizes the projection methodology of insured persons and beneficiaries.



Chart A3.1 Flow of financial balance projection

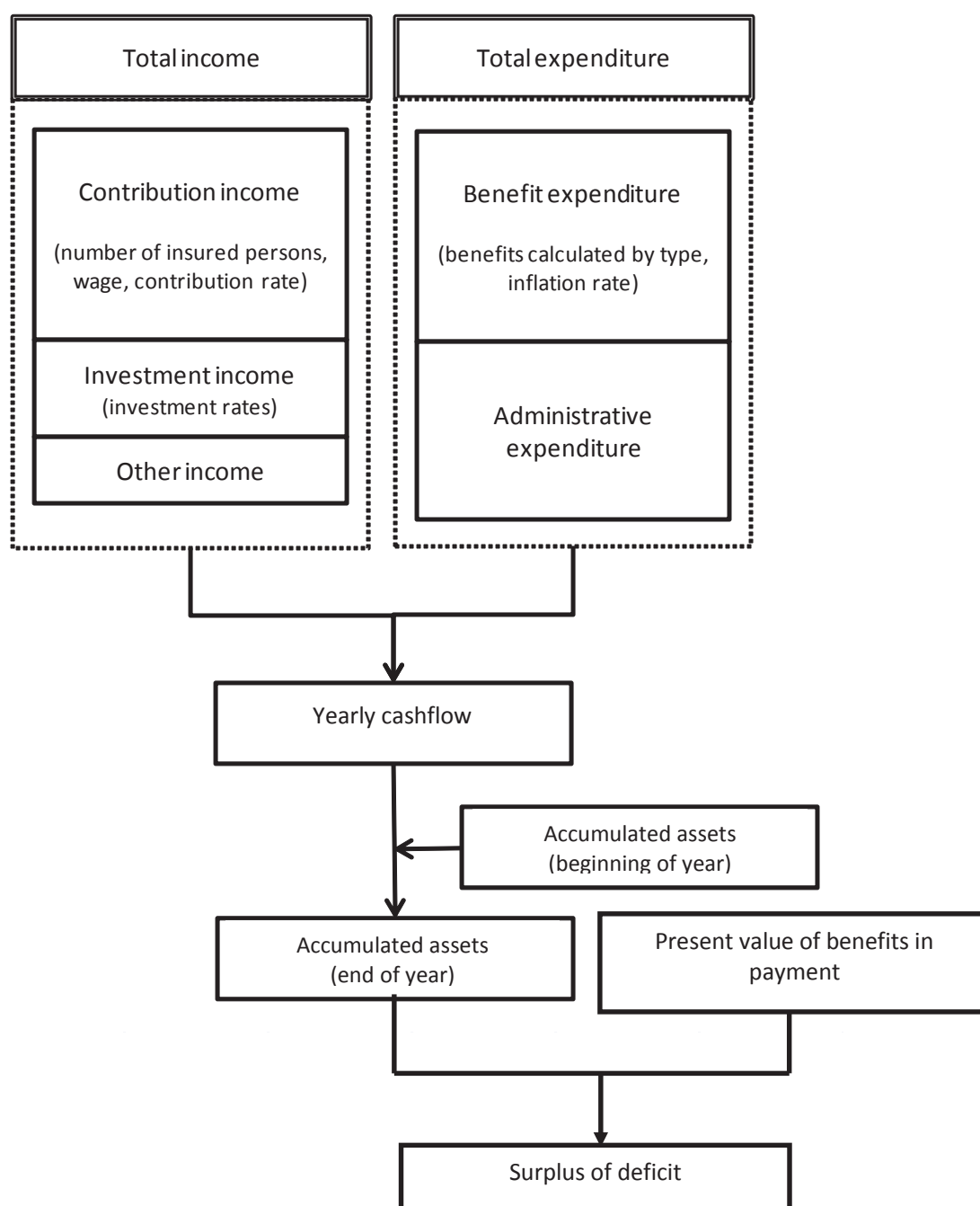
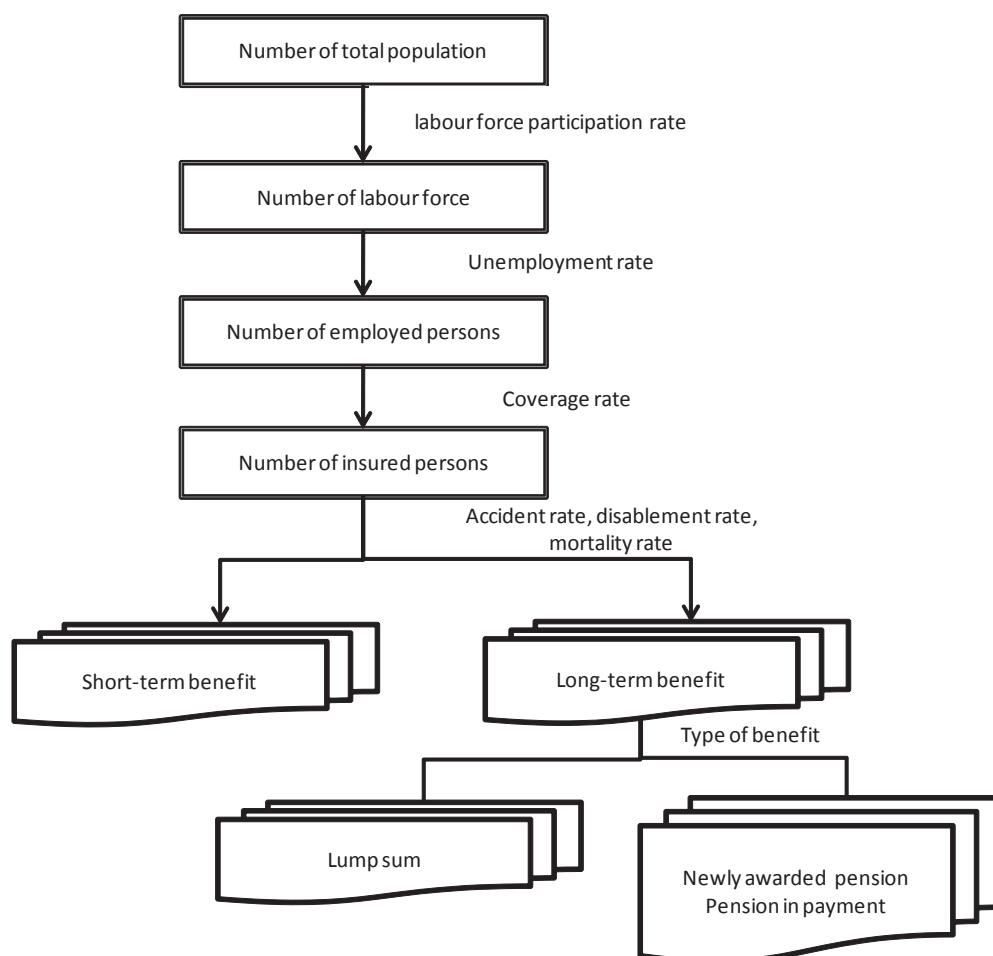


Chart A3.2 Projection methodology of insured persons and beneficiaries



### Purpose of pension projections

The purpose of the pension model is twofold. First, it is used to assess the financial viability of the long-term benefits of the schemes. This refers to the measure of the long-term balance between income and expenditure of the system. In case of imbalance, a revision of the contribution rate or the benefit structure is recommended. Second, the model may be used to examine the financial impact of different reform options, thus assisting policy-makers in the design of benefit and financing provisions. More specifically, the pension model is used to develop long-term projections of expenditures and insurable earnings under the system, for the purpose of:

- assessing the options to build up a contingency or a technical reserve;
- proposing schedules of contribution rates consistent with the funding objective;
- testing how the system reacts to changing economic and demographic conditions.

### Pension data and assumptions

In addition to the demographic and macro-economic frame already described, benefit projections require a set of assumptions specific to the WCF.

The database as of the valuation date includes the insured population, the distribution of insurable wages among contributors and pensions in payment. Data are disaggregated by age and sex.

System-specific assumptions such as the incidence rates and the related severity of benefit claims are determined with reference to the system provisions and the historical experience under the system.

The projection of the annual investment income requires information on the existing assets on the valuation date. A rate of return assumption is formulated on the basis of the nature of the system's assets, the past performance of the Fund, the system's investment policy and assumptions on future economic growth and wage development. For the Tanzania scheme, current tax rules regarding investment income have been considered.

### ***Benefit projection approach***

The projection of insurable earnings and benefit expenditures are then performed according to the economic assumptions and the system's provisions.

The income and expenditure are determined on an incurred basis in order to respect the funding method. Expected contributions are based on the insurable earnings of the year and benefits costs include the total value of benefits to be paid to the workers suffering an incident subject to compensation during the year. From an accounting angle, the projected costs include the provision for claims incurred but not yet reported. The pensions for disability of survivors of work-related deceased in each financial year are projected over their total lifetime or until termination.

Permanent disability pensions and survivors' pensions are long-term benefits. Hence the financial obligations that a society accepts when adopting financing provisions and benefit provisions for them are also of a long-term nature.

The objective of benefits projections is not to forecast the exact development of income and expenditures of the system, but to check its financial viability. This entails evaluating the system with regard to the relative balance between future revenue and expenditure.

## A4 APPENDIX 4: WCF SPECIFIC DATA AND ASSUMPTIONS

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In addition to the demographic and economic assumptions presented in Section 2, the projection of the future financial development of the Employment Injury scheme requires a database specific to the system (characteristics of insured persons and pensions in payment) and some particular actuarial assumptions.

In general, the data requested to build and project the actuarial model was of good quality though its volume was small and makes assumptions and results subject to uncertainty. The data gathering process at WCF seems to be thorough and comprehensive. However, one careful reader must remember that the scheme is new and that there is not a lot of historical experience on which the assumption can be derived from. WCF must remain prudent into its decision-taking process based on this limited experience but can also rest assured that the data gathering process is comprehensive enough to solidify the basis for assumptions and projections in the future actuarial valuation, especially if industry rating is an objective. Since historical data is limited based on the short lifetime of the scheme, actuarial judgment and smoothing techniques were used to alleviate the lack of comprehensive scheme experience. This situation should resolve by itself as the scheme will mature in the future. Some elements regarding prospective change to the data gathering process are explained in Section 4 of the report.

Limitations on the data have an impact on the design of modelling and the presentation of results. For example, it is interesting for analysis purposes to distinguish incidents in three categories: accidents at work place, occupational diseases and commuting ones. The model projects the cost of benefits for each category of incidents, but as the determination of assumptions for each category is subject to uncertainty, the results are presented for the three categories all together given their higher credibility. The distribution of costs by category is discussed separately. The same remarks apply regarding the projection of benefits by sector. The base scenario projects the insured population separately for the private and the public sectors but it uses the same assumption regarding the incidence and severity of benefits for both sectors. For the discussion on the rate setting by sector, some additional refinement was included so as to recognize the specific experience of each sector for a small number of assumptions when justified by the volume.

### A4.1 DATA AND ASSUMPTIONS ON INSURED POPULATION

#### *Number of insured persons*

The 2018 population presented in Table A4.1 relates to the population in all age groups, and therefore indicates the coverage of the Employment Injury scheme.

**Table A4.1 Insured persons, by age and sex, in 2018**

Age	Private Sector			Public Sector		
	Male	Female	Total	Male	Female	Total
15-19	3,490	1,924	5,414	1,613	1,070	2,683
20-24	33,144	17,393	50,537	13,831	10,008	23,839
25-29	85,538	40,895	126,433	37,542	24,402	61,944
30-34	114,589	47,369	161,958	61,225	30,450	91,675
35-39	96,193	30,006	126,199	62,883	22,461	85,344
40-44	58,298	11,090	69,388	49,421	11,173	60,594
45-49	34,784	5,254	40,038	35,368	5,884	41,252
50-54	25,525	4,842	30,367	25,272	4,189	29,461
55-59	18,495	3,232	21,727	16,457	2,524	18,981
60-64	10,337	1,268	11,605	7,932	991	8,923
65+	5,010	408	5,418	2,886	294	3,180
<b>Total 15-59</b>	<b>470,056</b>	<b>162,005</b>	<b>632,061</b>	<b>303,612</b>	<b>112,161</b>	<b>415,773</b>
<b>Grand Total</b>	<b>485,403</b>	<b>163,681</b>	<b>649,084</b>	<b>314,430</b>	<b>113,446</b>	<b>427,876</b>

The projection of the insured population is calculated by applying coverage rates (by age, sex and sector) to the employed population in the formal economy as determined under the economic framework. Age-specific coverage rates are assumed constant for the whole projection period for the public sector workers and is increasing linearly over 50 years for the private sector to reach a level of 50 per cent of the workers in the formal private sector of the economy. Coverage rates appearing in Table A4.2 are calculated as the ratio of insured persons to the employed population in the formal economy at the corresponding age.

**Table A4.2 WCF coverage rates, by age and sex, private sector (2018 and 2048)**

Age	2018		2048	
	Male (%)	Female (%)	Male (%)	Female (%)
17	26	24	32	51
22	89	81	100	100
27	90	75	100	100
32	66	48	84	100
37	40	22	51	49
42	23	8	29	17
47	17	5	22	12
52	21	9	26	20
57	30	14	38	30
62	44	16	56	35
<b>Total</b>	<b>40</b>	<b>26</b>	<b>48</b>	<b>44</b>

### **Insurable earnings**

Table A4.3 shows the average insurable earnings of active contributors.

**Table A4.3 Average monthly insurable earnings**

Age group	Private sector		Public sector	
	Male	Female	Male	Female
15-19	167,257	191,342	205,858	186,363
20-24	302,424	293,409	325,979	336,272
25-29	596,910	569,481	532,239	546,852
30-34	965,884	1,045,678	734,112	737,931
35-39	1,366,832	1,159,040	982,416	928,823
40-44	1,589,078	1,180,579	1,172,720	1,031,518
45-49	1,740,871	1,233,105	1,308,025	1,149,412
50-54	1,504,387	1,372,981	1,344,866	1,211,335
55-59	1,531,675	1,913,862	1,448,845	1,254,654
60+	1,380,285	1,648,384	1,460,311	1,295,835
<b>Average</b>	<b>1,193,787</b>	<b>905,657</b>	<b>983,981</b>	<b>779,541</b>

The average monthly insured salary of the contributing population is derived from a subset of individual data from WCF insured database and the total contribution assessment based by sector as such in the draft financial statement of the scheme for year 2018. The figures of the subset were transmitted by the participating employers that use the electronic contribution assessment system of WCF. This new system was rolled-out at the beginning of 2018, which explains why the information of all insured members was not available at the time of the actuarial valuation. The subset is comprised of 127,445 records, which can be further detailed as such:

- Male – Private sector: 91,642 records
- Female – Private sector: 30,186 records
- Unspecified sex – Private sector: 820 records
- Male – Public sector: 3,699 records
- Female – Public sector: 1,058 records
- Unspecified sex – Public sector: 30 records

As can be seen in the above data, the credibility of the subset is higher for the private sector than the public sector. Hence, a distribution of the given salary by sex and age was made based on the subset of data for the private sector. Then, this distribution was adjusted to fit the contribution for the private sector in 2018 based on the initial covered population as at valuation date. For the public sector, the distribution of salary was based on the latest salary distribution of the PSSSF, also with an adjustment on the distribution to fit the contribution received in 2018.

In order to better take into account the effect of minimum and maximum limits on the benefits, the average salary by age and sex is refined into three salary groups, the 30 percent lowest salaries, the 40 percent medium salaries and the 30 percent highest salaries. The distribution of insured persons according to their salary is assumed to remain constant over the projection period. The average salary by age, sex and salary group is projected according to the assumption of wage increase. Tables A4.4 and A4.5 summarize the distribution by level of salaries for the private and public sector respectively.

**Table A4.4 Average monthly insurable earnings, private sector**

Age group	Low salaries		Medium salaries		High salaries	
	Male	Female	Male	Female	Male	Female
15-19	73,179	73,447	130,907	145,090	309,801	370,907
20-24	106,240	101,517	191,757	182,611	646,163	633,033
25-29	131,016	105,078	296,947	276,539	1,462,755	1,424,474
30-34	153,338	113,445	377,173	357,161	2,563,378	2,895,933
35-39	156,796	118,509	414,425	380,869	3,846,744	3,237,133
40-44	157,648	121,345	394,546	373,191	4,613,216	3,316,329
45-49	166,290	126,852	423,328	382,504	5,072,176	3,473,493
50-54	169,830	132,851	437,748	460,723	4,261,130	3,829,457
55-59	163,906	176,987	428,076	576,462	4,370,909	5,433,937
60+	154,821	212,527	376,066	703,435	3,944,707	4,344,172
<b>Average</b>	<b>151,712</b>	<b>114,354</b>	<b>376,634</b>	<b>333,162</b>	<b>3,325,400</b>	<b>2,460,286</b>

**Table A4.5 Average monthly insurable earnings, public sector**

Age group	Low salaries		Medium salaries		High salaries	
	Male	Female	Male	Female	Male	Female
15-19	88,247	80,534	163,309	148,676	380,201	342,441
20-24	128,920	132,038	299,253	327,894	558,673	551,678
25-29	265,229	290,888	468,642	493,349	884,045	874,153
30-34	350,871	397,340	602,466	628,055	1,292,880	1,225,022
35-39	398,191	472,520	741,080	750,911	1,888,423	1,622,343
40-44	440,923	512,541	827,081	848,671	2,365,369	1,794,293
45-49	487,559	559,714	945,678	980,895	2,611,621	1,963,799
50-54	562,333	641,235	1,062,870	1,044,262	2,503,395	2,004,199
55-59	671,088	772,327	1,201,143	1,106,339	2,556,871	1,934,732
60+	739,836	835,811	1,227,091	1,153,306	2,491,745	1,945,896
<b>Average</b>	<b>415,666</b>	<b>405,018</b>	<b>762,358</b>	<b>664,390</b>	<b>1,847,794</b>	<b>1,307,600</b>

### **Density of contributions**

Density of contribution represents the proportion of the year during which the average contributor pays contributions. Density is useful when the insured population is defined as the number of workers who contribute at least once in a year. For the WCF, it is more practical to rely on the average number of workers for which contributions are paid during the year as it is a more appropriate base to determine the incidence of claims. The density is then set at 100 per cent. Hence, for the current actuarial valuation, it is assumed that the density of contribution is 100 per cent for all age, sex and sector.

## A4.2 DEMOGRAPHIC ASSUMPTIONS RELATED TO THE SCHEME

### *Mortality of insured persons*

The mortality rates used for the projection of the general population have been used and adjusted to take into account the expectation that the insured population of WCF is wealthier than the general population of the United Republic of Tanzania and as a consequence, has a higher life expectancy. The adjustments have been done in line with the last actuarial valuations made for the other branches of social security (mainly NSSF and PSSSF), assuming that the life expectancy of WCF members at age 60 is estimated at 21.3 for males and 22.8 for females in 2018, thus exceeding the general population life expectancy at age 60 by around 3 years. WCF members' mortality rates are assumed to decline continually during the projection period although the gap between the PSSSF members' life expectancy and the general population life expectancy is assumed to gradually decrease from around 3 years in 2018 to about 1 year in 2093.

It is noted that the mortality pattern used for WCF members is also used to project survivor benefits payable at the time of a member's death.

**Table A4.6 Sample mortality rates (per 100) by age and sex**

Age	Male		Female	
	2018	2048	2018	2048
0	4.337	3.215	3.390	2.478
5	0.282	0.200	0.226	0.160
10	0.148	0.106	0.119	0.084
15	0.170	0.126	0.126	0.090
20	0.252	0.189	0.172	0.124
25	0.306	0.228	0.226	0.162
30	0.350	0.260	0.281	0.199
35	0.422	0.311	0.350	0.247
40	0.521	0.383	0.445	0.315
45	0.647	0.482	0.539	0.387
50	0.858	0.655	0.678	0.496
55	1.131	0.879	0.878	0.651
60	1.594	1.264	1.251	0.938
65	2.407	1.947	1.969	1.499
70	3.716	3.050	3.214	2.485
75	5.854	4.875	5.268	4.138
80	9.208	7.800	8.548	6.834
85	14.120	12.221	13.269	10.850
90	20.421	18.160	19.201	16.185
95	28.966	27.726	28.055	26.372
100	100.000	100.000	100.000	100.000

### *Family structure*

Information on the family structure of the insured is necessary for the projection of survivors' benefits. Assumptions have to be established on the probability of being married at death, the average age of the spouses, the average number of children, siblings and parents possibly eligible to benefits and their average age. Sample assumptions are shown in Table A4.7.



Table A4.7 Family structure

Age	Deceased male							Deceased female						
	Spouse		Orphans and siblings		Parents				Spouse		Orphans and siblings		Parents	
	Probability	Avg. age	Avg. number	Avg. age	Avg. number	Avg. age			Probability	Avg. age	Avg. number	Avg. age	Avg. number	Avg. age
17	3%	16	1.00	2	1.16	48		24%	22	1.00	2	1.12	47	
22	25%	19	2.00	3	1.18	52		66%	27	2.00	3	1.06	52	
27	55%	23	2.50	4	0.96	57		83%	32	3.00	5	0.88	57	
32	75%	27	3.00	5	0.54	61		88%	37	4.00	8	0.55	62	
37	85%	31	3.60	8	0.30	66		88%	42	3.00	9	0.31	66	
42	90%	35	4.00	9	0.14	70		83%	47	2.00	10	0.25	71	
47	95%	38	3.00	10	0.11	75		77%	52	1.00	11	0.17	76	
52	95%	43	2.00	11	0.07	80		72%	57	0.80	12	0.09	80	
57	95%	47	1.00	11	0.02	84		61%	62	0.60	14	0.04	85	
62	95%	52	0.60	14	-	-		55%	67	0.40	17	-	-	
67	90%	57	0.20	17	-	-		55%	72	0.20	21	-	-	
72	85%	62	-	-	-	-		50%	77	-	-	-	-	
77	80%	67	-	-	-	-		50%	82	-	-	-	-	
82	80%	72	-	-	-	-		44%	87	-	-	-	-	
87	80%	77	-	-	-	-		44%	92	-	-	-	-	

For the demographic and financial projections of WCF, a certain number of assumptions have to be set. They have been determined by using the assumptions of spouse and orphans of the other social security scheme of Tanzania Mainland past actuarial valuation. For the parents' assumption, the assumption was based on the experience of the employment injury benefit of Malaysia. It is important to note that the assumption used in the past actuarial valuation of social security schemes in Tanzania Mainland were developed using generic table that were adjusted to reflect the past experience of the scheme. Smoothing techniques have used in order to avoid certain irregularities in the patterns due to small volume of data.

The mortality rate applicable to parents is assumed to be an equal mix of the mortality of a male and a female insured person.

When more experience will be available, it will be possible to consider the family structure of work-related deceased workers in combination with that of other schemes as long as needed for credibility purposes.

### ***Incidence rate***

According to the ILO-EII model used, active members are subject to three types of incidents while they are insured: accident, disease or commuting accident. Table A4.8 shows sample assumptions that were used in the current actuarial projections for the projection of benefits of both sectors altogether.

**Table A4.8 Incident rate of active members** (per 1,000 insured persons)

Age	Male (private and public sector)							Female (private and public sector)						
	Accident		Disease		Commuting				Accident		Disease		Commuting	
	2018	2030	2018	2030	2018	2030			2018	2030	2018	2030	2018	2030
17	1.074	5.372	-	-	0.180	0.899		0.005	0.027	-	-	0.003	0.012	
22	0.957	4.783	0.004	0.022	0.208	1.044		0.046	0.232	-	-	0.034	0.168	
27	0.865	4.323	0.008	0.041	0.225	1.129		0.167	0.837	-	-	0.168	0.837	
32	0.795	3.977	0.011	0.054	0.235	1.171		0.248	1.242	0.008	0.038	0.296	1.480	
37	0.747	3.735	0.012	0.060	0.236	1.179		0.318	1.590	0.017	0.087	0.391	1.955	
42	0.717	3.587	0.012	0.061	0.233	1.164		0.395	1.974	0.029	0.143	0.433	2.168	
47	0.706	3.530	0.011	0.055	0.226	1.128		0.488	2.441	0.041	0.205	0.415	2.072	
52	0.712	3.562	0.009	0.043	0.215	1.074		0.598	2.988	0.055	0.273	0.334	1.670	
57	0.737	3.684	0.005	0.024	0.200	1.000		0.712	3.561	0.070	0.348	0.204	1.017	
62	0.780	3.902	-	-	0.180	0.900		0.812	4.060	0.086	0.430	0.042	0.212	
67	0.845	4.223	-	-	0.153	0.768		0.748	3.740	0.103	0.517	-	-	

The assumption for the initial year (2017-2018) was derived from the experience of the scheme. This information was gathered by WCF and transmitted to the ILO for further analysis. Additional details on the claims were transmitted to the ILO as part of the actuarial valuation process. It is important to note that the number of claims is very low for occupational diseases. It is in fact in line with international experience as the incidence of occupational diseases is lower than that of accidents and several diseases take a long time to develop and may occur later on in the claims data of the scheme. Table A4.9 shows aggregate data on the claims that were used to derive the assumption.

**Table A4.9 Number of claims used to derive the incidence<sup>16</sup> rate assumption**

Age Gr.	Male			Female		
	Accident	Disease	Commuting	Accident	Disease	Commuting
15-24	40	0	7	2	0	2
25-29	69	0	20	6	0	6
30-34	57	1	16	4	0	6
35-39	47	3	19	3	0	5
40-44	32	1	12	3	0	7
45-49	27	0	10	3	0	2
50-54	30	0	11	4	0	2
55-59	15	0	6	5	1	1
60+	13	0	1	2	0	0
<b>Total</b>	<b>330</b>	<b>5</b>	<b>102</b>	<b>32</b>	<b>1</b>	<b>31</b>

The initial incidence of expected claims was then projected to increase in the future year except for the work-related deaths. This is justified by the fact that the scheme is very young and that some claims may not have been properly reported for benefit payment. The assumption used for the current actuarial valuation is that the expected number of claims will increase linearly from 2018 up to 2030, at which time they will remain stable for the rest of the projection period. The increase factor for each incident type is 5 times the original decrement rate, to be attained in 2030. This assumption, which is based on international experience of developing countries comparable to Tanzania, is subject to much uncertainty.

#### ***Probability for each benefit type following an incident***

According to the ILO-EII model used, once the number of insured members that will be eligible to compensation following one of the incidence rates has been determined, the model must project the probability of filing a claim under four different types of benefits. These benefits are:

- Medical;
- Short-term disability;
- Long-term disability; and
- Death.

The probability of having a certain type of benefit was established by type of incidence (accident, disease and commuting) following an analysis of the experience of the scheme. Table A4.10, A4.11 and A4.12 shows a sample of the assumptions used.

<sup>16</sup> The first set of data provided death as an incidence rate, but no specific separation was made for commuting accident. Further information was transmitted later on to allow the categorization of each death related to its incidence (accident, disease or commuting accident) and to separate the number of accidents that are related to commuting.

**Table A4.10 Probability of having a type of benefit following an accident (per 1,000 accidents)**

Age	Male (private and public sector)					Female (private and public sector)				
	Medical	STD	LTD	Death 2018	Death 2030	Medical	STD	LTD	Death 2018	Death 2030
17	183.721	663.209	364.966	1.482	0.296	5.944	1,000.000	335.977	765.238	141.711
22	456.947	811.184	327.155	5.712	1.143	343.376	1,000.000	313.154	765.238	151.728
27	498.111	884.171	295.171	9.270	1.855	399.515	1,000.000	287.561	214.376	42.773
32	437.713	934.441	268.497	13.486	2.696	336.634	1,000.000	259.351	146.158	29.185
37	363.864	974.548	246.713	19.183	3.837	248.018	1,000.000	228.463	120.185	24.037
42	327.900	1,000.000	229.498	26.314	5.260	181.719	999.765	194.621	102.020	20.414
47	347.516	1,000.000	216.629	35.584	7.117	156.303	990.409	157.334	83.411	16.675
52	407.406	1,000.000	207.982	49.440	9.882	168.579	986.962	115.896	73.215	14.653
57	457.422	1,000.000	203.532	65.489	13.101	193.327	989.423	69.387	66.765	13.349
62	408.246	1,000.000	203.350	93.506	18.692	175.006	997.793	16.671	71.036	14.207
67	124.572	1,000.000	207.607	135.168	27.046	11.460	1,000.000	-	97.342	19.468

**Table A4.11 Probability of having a type of benefit following the diagnosis of an occupational disease** (per 1,000 occupational diseases)

Age	Male (private and public sector)					Female (private and public sector)				
	Medical	STD	LTD	Death 2018	Death 2030	Medical	STD	LTD	Death 2018	Death 2030
17	179.970	660.596	362.396	-	-	5.499	1,000.000	326.146	-	-
22	455.507	811.139	329.837	-	-	345.864	1,000.000	314.545	-	-
27	503.027	885.657	300.793	-	-	433.196	1,000.000	297.273	-	-
32	445.720	935.604	275.263	-	-	387.264	1,000.000	274.332	-	-
37	371.826	973.227	253.248	-	-	297.440	1,000.000	245.721	-	-
42	334.633	1,000.000	234.748	-	-	222.697	1,000.000	211.440	-	-
47	352.481	1,000.000	219.763	-	-	191.614	1,000.000	171.489	-	-
52	408.757	1,000.000	208.292	-	-	202.374	1,000.000	125.868	-	-
57	451.901	1,000.000	200.337	-	-	222.761	1,000.000	74.577	-	-
62	395.403	1,000.000	195.896	-	-	190.163	1,000.000	17.617	-	-
67	117.800	1,000.000	194.970	-	-	11.572	1,000.000	-	-	-

**Table A4.12 Probability of having a type of benefit following a commuting accident** (per 1,000 commuting accidents)

Age	Male (private and public sector)						Female (private and public sector)				
	Medical	STD	LTD	Death 2018	Death 2030		Medical	STD	LTD	Death 2018	Death 2030
17	167.598	648.822	357.593	4.865	0.974		4.124	750.000	327.655	898.567	224.642
22	451.015	811.443	342.059	15.639	3.116		319.527	807.444	317.886	138.997	28.130
27	519.222	893.923	322.052	22.079	4.400		502.835	873.427	299.719	26.021	5.223
32	471.314	944.074	299.381	29.284	5.877		525.946	927.592	273.632	14.054	2.811
37	396.299	972.772	275.502	39.619	7.931		450.890	969.939	240.383	10.709	2.142
42	353.835	980.773	251.519	53.779	10.765		363.920	1,000.000	201.020	9.816	1.960
47	363.800	952.773	228.187	74.843	14.995		328.205	1,000.000	156.873	10.062	2.015
52	404.676	915.533	205.904	111.493	22.319		354.556	1,000.000	109.560	13.036	2.607
57	420.760	869.054	184.721	165.756	33.151		390.182	1,000.000	60.983	22.706	4.555
62	338.199	813.335	164.334	280.773	56.155		325.484	1,000.000	13.329	129.426	25.641
67	89.850	750.000	146.227	519.207	103.436		18.887	975.856	-	-	-

All the above probabilities are maintained at their current level throughout the projection, except for the probability of having a death that is work-related. This assumption changes in line with the increase of the incident rate for each type (accident, disease, commuting). This reduction of the death probability is to ensure that the proportion of death remains the same throughout the projection, even if the incidence rate is increase. The underlying assumption is that all the death cases are already handled by WCF as they are more visible than other types of benefit. Hence, there is no reason to assume that the proportion of deaths that are related to work should be increasing at a faster rate compared to the current assumption. The decrease in the death assumption is the result of the above.

#### **Medical claim amount**

Table A4.13 shows a sample of the assumption used for the amount of benefit paid for medical expenses.

**Table A4.13 Amount paid per medical claim in 2018 (in TZS)**

Age	Male (private and public sector)				Female (private and public sector)		
	Accident	Disease	Commuting		Accident	Disease	Commuting
17	1,202,300	1,205,134	1,254,756		197,995	183,596	184,357
22	946,999	962,913	1,044,336		269,611	272,670	274,482
27	819,726	843,014	937,166		290,525	316,761	319,415
32	735,462	762,649	856,113		299,077	346,315	349,549
37	673,612	702,115	784,374		305,204	368,575	372,090
42	625,782	653,536	715,955		313,234	386,440	389,902
47	587,668	612,961	648,267		325,543	401,361	404,418
52	556,740	578,120	580,105		343,626	414,173	416,453
57	531,369	547,593	510,908		368,512	425,399	426,515
62	510,437	520,428	440,450		400,957	435,388	434,942
67	493,135	495,957	371,968		441,541	444,387	441,968

The distribution by age for the medical claim amount is derived from all the medical claim experience of WCF for the last two years. Adjustments were made for each type of incidence, based on the average amount per type of incidence. These amounts are indexed each year by the inflation assumption used the actuarial projection.

#### **Short-term disability amount**

Table A4.14 shows a sample of the assumptions used for the determination of amount of benefits paid for short-term disability.



**Table A4.14 Assumptions used to determine short-term benefit payment in 2018**

Age	Male (private and public sector)							Female (private and public sector)						
	Accident		Disease		Commuting				Accident		Disease		Commuting	
	Number of days	Degree of incapacity	Number of days	Degree of incapacity	Number of days	Degree of incapacity			Number of days	Degree of incapacity	Number of days	Degree of incapacity	Number of days	Degree of incapacity
17	49	74%	230	74%	63	74%		97	56%	0	56%	74	56%	
22	59	80%	229	80%	75	80%		99	65%	3	65%	89	65%	
27	64	85%	229	85%	81	85%		99	72%	19	72%	99	72%	
32	68	88%	229	88%	83	88%		99	77%	30	77%	106	77%	
37	71	91%	228	91%	84	91%		99	79%	38	79%	110	79%	
42	73	92%	228	92%	83	92%		100	79%	45	79%	112	79%	
47	75	91%	228	91%	81	91%		101	77%	51	77%	110	77%	
52	77	90%	228	90%	77	90%		103	72%	55	72%	105	72%	
57	79	87%	228	87%	73	87%		106	65%	59	65%	98	65%	
62	80	83%	228	83%	67	83%		109	56%	63	56%	87	56%	
67	82	78%	228	78%	61	78%		114	50%	67	50%	86	50%	

The figures above remain constant throughout the projection. The usage of the above assumptions with the salary distribution by age allows a determination of the amount of benefit per claim. The ILO-EII considers all of the above in order to reach to the projection of the amount of benefits paid for the short-term disability benefit.

#### ***Long-term disability amount***

Tables A4.14 and A4.15 show a sample of the assumptions used for the determination of amount of benefits paid for long-term disability. The probability of having a degree of disability of 30 per cent and above, which is not presented in the tables, is the complement of the probability of having a degree of less than 30 per cent.

**Table A4.15 Assumptions used to determine long-term benefit payment in 2018 - Male**

Age	Accident				Disease				Commuting		
	Probability of having a degree less than 30%	Degree of incapacity if less than 30%	Degree of incapacity if more than 30%		Probability of having a degree less than 30%	Degree of incapacity if less than 30%	Degree of incapacity if more than 30%		Probability of having a degree less than 30%	Degree of incapacity if less than 30%	Degree of incapacity if more than 30%
17	88%	16%	94%		88%	8%	95%		88%	16%	100%
22	85%	13%	74%		85%	10%	74%		85%	13%	82%
27	83%	12%	64%		83%	10%	64%		83%	12%	69%
32	82%	11%	57%		82%	11%	58%		82%	11%	60%
37	82%	10%	52%		82%	11%	53%		82%	10%	54%
42	81%	10%	48%		81%	11%	48%		81%	10%	49%
47	81%	10%	45%		81%	11%	45%		81%	9%	45%
52	80%	9%	42%		80%	12%	42%		80%	9%	42%
57	80%	9%	40%		80%	12%	40%		80%	9%	39%
62	80%	9%	37%		80%	12%	37%		80%	9%	37%
67	79%	9%	35%		79%	12%	35%		79%	9%	35%

Table A4.16 Assumptions used to determine long-term benefit payment in 2018 - Female

Age	Accident				Disease				Commuting		
	Probability of having a degree less than 30%	Degree of incapacity if less than 30%	Degree of incapacity if more than 30%		Probability of having a degree less than 30%	Degree of incapacity if less than 30%	Degree of incapacity if more than 30%		Probability of having a degree less than 30%	Degree of incapacity if less than 30%	Degree of incapacity if more than 30%
17	100%	26%	82%		100%	26%	82%		100%	27%	94%
22	86%	19%	69%		86%	19%	69%		86%	19%	77%
27	74%	15%	63%		74%	15%	63%		74%	15%	68%
32	66%	13%	58%		66%	13%	59%		66%	13%	62%
37	60%	11%	55%		60%	11%	56%		60%	11%	57%
42	56%	9%	53%		56%	10%	53%		56%	9%	54%
47	52%	8%	51%		52%	8%	51%		52%	8%	51%
52	48%	7%	49%		48%	7%	49%		48%	7%	49%
57	45%	6%	47%		45%	6%	47%		45%	6%	47%
62	43%	6%	46%		43%	6%	46%		43%	6%	46%
67	40%	5%	45%		40%	5%	45%		40%	5%	45%

These assumptions were set out in line with the benefit provision of WCF. The nature of the benefit payment differs for incapacity below and above 30 per cent. A lump sum is paid for incapacities less than 30 per cent while a lifetime pension is paid in all other cases. Hence, the projection of the cash flows and the incurred costs needs to consider the specific nature of the payment and the probability of such cases to happen during the period analyzed.

The above assumptions remain the same throughout the projection period.

For the disabled pensioners in payment, the mortality rate used is based on the mortality rate of the insured persons. This mortality rate is adjusted to be 5 times the mortality rate of the insured population up to age 20. From age 20 to age 60, the factor of 5 is reduced linearly to reach the mortality level of the insured persons at age 60. Beyond age 60, the mortality rate is the same for disabled pensioners and the insured population.

## A4.3 OTHER ASSUMPTIONS

### *Funeral benefit amount*

The amount of funeral benefit paid in 2018 is set at 400,000 TZS. This is the current amount paid by WCF to the beneficiaries of work related accidents. In subsequent years, this amount is indexed in line with the inflation rate modelled in the macroeconomic framework presented in Section 2.

### *Indexing of the system's parameters, medical amounts and pensions in payment*

Minimum and maximum pensions payable are indexed annually in line with CPI.

The pensions in payment and the medical amount claims are assumed to increase annually from 1 July 2018 according to the CPI.

### *Administrative expenses*

The administrative expenses of the scheme are set at 17.3 per cent of the contribution paid to the scheme for the first projection year of the scheme. This assumption was derived from the latest draft financial statement of WCF for the financial year 2017-2018. This percentage is assumed constant over the projection period for the base scenario. This is based on the assumption that the increase in the insurable earnings is an appropriate indicator of the increase in needed resources.

For the purpose of determining the cost by sector for certain analyses, it is assumed that administrative expenses are allocated according to the share of each sector in the insured earnings and the benefit cost in equal proportion.

Share of sector (i) =

$0.5 \times (\text{insurable earnings (i)} / \text{total insurable earnings} + \text{benefit cost (i)} / \text{total benefit cost})$

### *Rate of return*

Table A4.17 shows the rate of return that is used in the actuarial valuation.

**Table A4.17 Rate of return (in %)**

Year	18-19	19-20	20-21	21-22	22-23	23-24	24-25+
Rate	6.0	6.1	6.2	6.2	6.2	6.1	6.0

The underlying assumption for the real rate of return is 1 per cent per year after tax and investment fees. This assumption is derived from the real rate of return benchmark in the investment policy of WCF and is also compatible with the historical real rate of return of other social security schemes in Tanzania.

## A4.4 PENSIONS IN PAYMENT ON 1 JULY 2018

Table A4.18 Long-term disability annual pensions (in TZS)

Age	Male			Female	
	Number	Average monthly pension		Number	Average monthly pension
15-19	0	0		0	0
20-24	5	975,749		0	0
25-29	5	1,294,291		0	0
30-34	4	816,921		0	0
35-39	0	0		0	0
40-44	3	3,376,906		0	0
45-49	0	0		0	0
50-54	1	2,005,975		0	0
55-59	1	2,190,552		0	0
60+	0	0		0	0
<b>Total</b>	<b>19</b>	<b>1,523,428</b>		<b>0</b>	<b>0</b>

Table A4.19 Widows and widowers' annual pensions according to the sex of dead spouse (in TZS)

Age	Male			Female	
	Number	Average monthly pension		Number	Average monthly pension
15-19	0	0		0	0
20-24	0	0		0	0
25-29	0	0		0	0
30-34	3	1,835,525		0	0
35-39	1	4,216,800		0	0
40-44	11	2,067,512		3	7,028,360
45-49	1	1,323,374		0	0
50-54	0	0		0	0
55-59	0	0		0	0
60+	0	0		1	2,705,170
<b>Total</b>	<b>16</b>	<b>2,111,836</b>		<b>4</b>	<b>5,947,562</b>

**Table A4.20 Orphans' annual pensions according to the sex of dead parent (in TZS)**

Age	Male			Female	
	Number	Average monthly pension		Number	Average monthly pension
0-4	10	1,115,913		1	3,022,860
5-9	11	1,138,539		1	3,022,860
10-14	4	696,085		2	4,105,920
15-19	3	743,051		1	4,105,920
20+	0	0		0	0
<b>Total</b>	<b>28</b>	<b>1,024,877</b>		<b>5</b>	<b>3,672,696</b>

*Note: no parents' pension is payable as at 1 July 2018.*